



**OECD Conference on the
Financial Management of Flood Risk**

Building financial resilience in a changing climate

**PRESENTATIONS –
SESSION 2**

**12-13 May 2016
Paris, France**





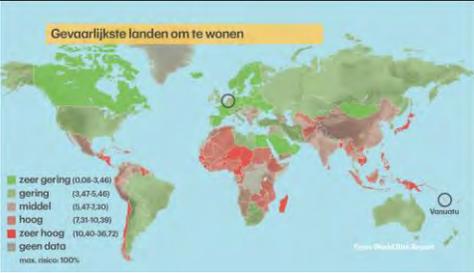
Ministry of Infrastructure and the Environment

Flood Risk Management in the Netherlands

12 May 2016

Inge Lardinois
Dep. Director for Water Management
Ministry of Infrastructure and the Environment

Gevaarlijkste landen om te wonen



| | |
|-------------|---------------|
| zeer gering | (0,08-3,46) |
| gering | (3,47-5,46) |
| middel | (5,47-20) |
| hoog | (20-93,36) |
| zeer hoog | (93,40-96,72) |
| geen data | |

max. risico 100%



Content

- About The Netherlands
- History
- Delta Act 2012
- New flood risk policy
- Cost-benefit analysis
- Delta Fund
- Public awareness
- Recent experiences
- Conclusions

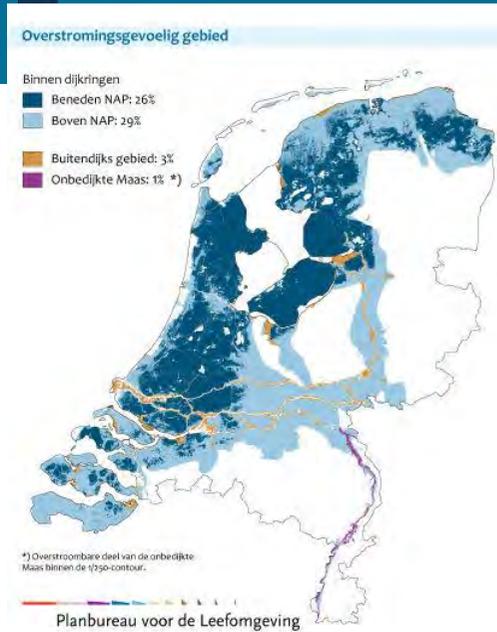


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The Netherlands

- 60% of the country is sensitive for floods:
 - 26% below sea level
 - 34% river floods
- In this area:
 - 9 million people
 - 70% of our GNP earned



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Dynamic delta



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History

- 1000 First man-made dyke
- 1255 First Official regional water authority ('Hoogheemraadschap van Rijnland')
- 1400 Wind mills pump out the water
- 1798 Founding National Water Authority ('Rijkswaterstaat')



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The 20th century

Large plans implemented as a response to disaster:

- 1916 floods (North) ->building Afsluitdijk
- 1953 flood disaster (South-West)
- 1993/1995 high water levels (rivers, large evacuations)





Afsluitdijk (1933)

Oosterscheldekering (1986)



Maeslantkering (1997)



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2012 Delta Act

- **Delta Programme**
provides a common long term goal and related policy objectives
- **Delta Fund**
average annual budget of €1.2 billion until 2028
- **Delta Commissioner** coordinates and supervises, reports on progress (to Cabinet and Parliament) and advises on necessary steps to maintain coherence

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New flood risk standards



Risk-based approach:
the new standards take into account:

- the risk of flooding
- the possible impact

Goals for 2050

1. Basic protection level for everyone
2. Prevent (as much as possible) large groups of casualties and major economic damage
3. Prevent failure of vulnerable functions with national consequences



Cost-benefit analysis

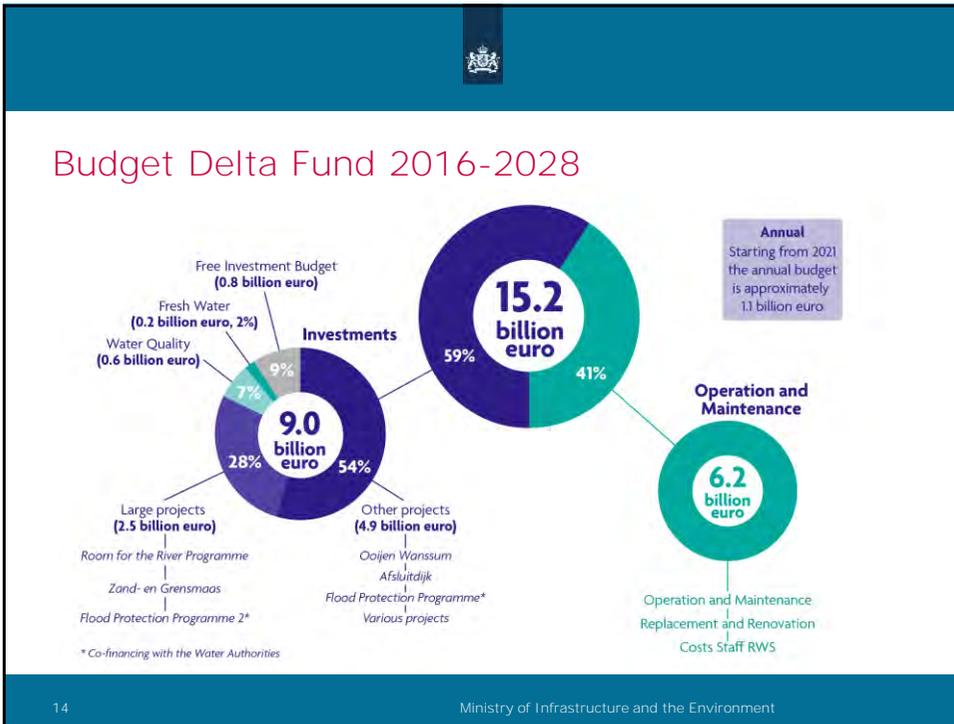
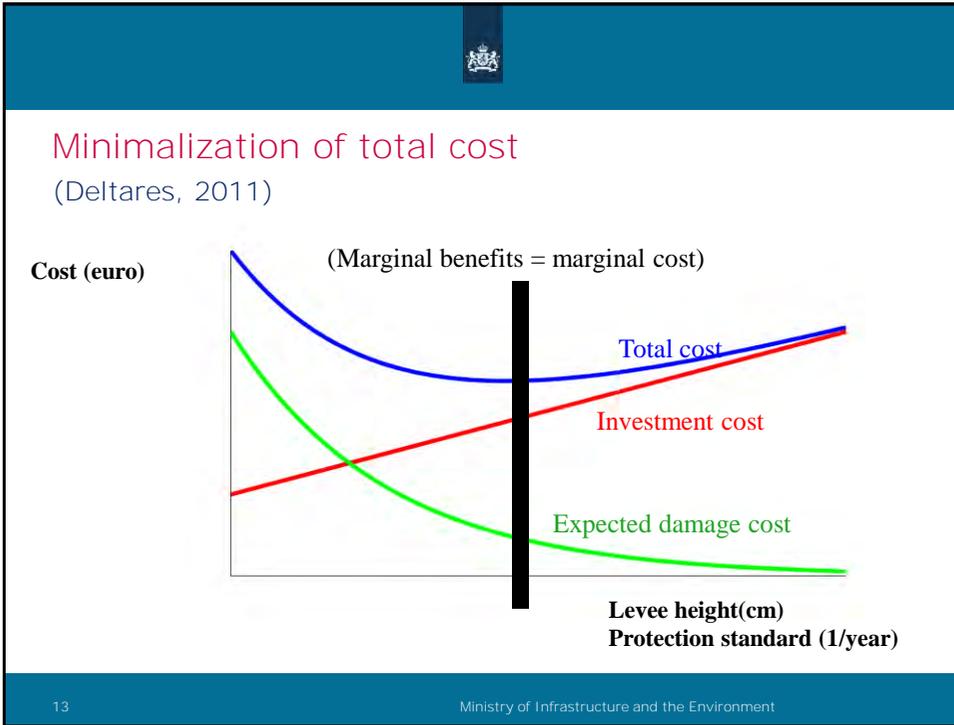
Cost-benefit analysis is used in two phases of the Delta Programme:

1. Political decision on flood protection standards:

- Equity
- Cost-benefit analysis

2. Preferred flood risk management strategy:

- Level of protection is fixed
- Cost-effectiveness analysis





Relative contribution of measures in terms of costs (2016)

Investments

| | | | |
|--|-----|---------|--------|
| • Flood Protection Programme | 307 | million | (35%) |
| • Programme Room for the River | 228 | million | (26%) |
| • Other projects flood protection | 117 | million | (13%) |
| • Study costs | 9 | million | (1%) |
| • Incentive Programme for Spatial Adaptation | 2,2 | million | (0,3%) |
| • Public awareness | 0,6 | million | (0,1%) |

Operation and Maintenance 206 million (24%)

TOTAL 870 million (100%)

Public awareness

- [Link Our Water](http://www.onswater.nl)
 - www.onswater.nl



Recent experiences/innovations

- Adaptive approach (short term decisions linked to long-term goals)

- From 'hard' physical infrastructure to 'soft' infrastructure ('Building with Nature')



- Room for the River: two goals
 1. water level decline
 2. spatial quality



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Conclusions

- Prevention is and remains the key principle
- Financial-economic analysis is used for decision-making
- Recently more attention is given to spatial adaptation, emergency response and awareness raising
- Working together in Delta Programme (Dutch 'poldermodel') works



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Managing Flood Risk

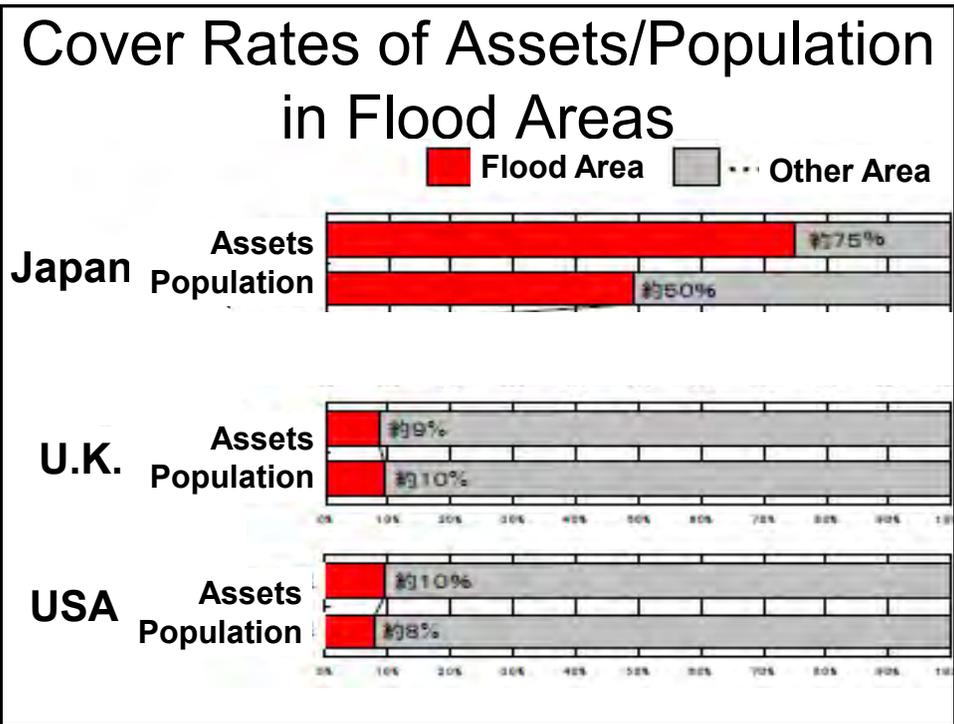
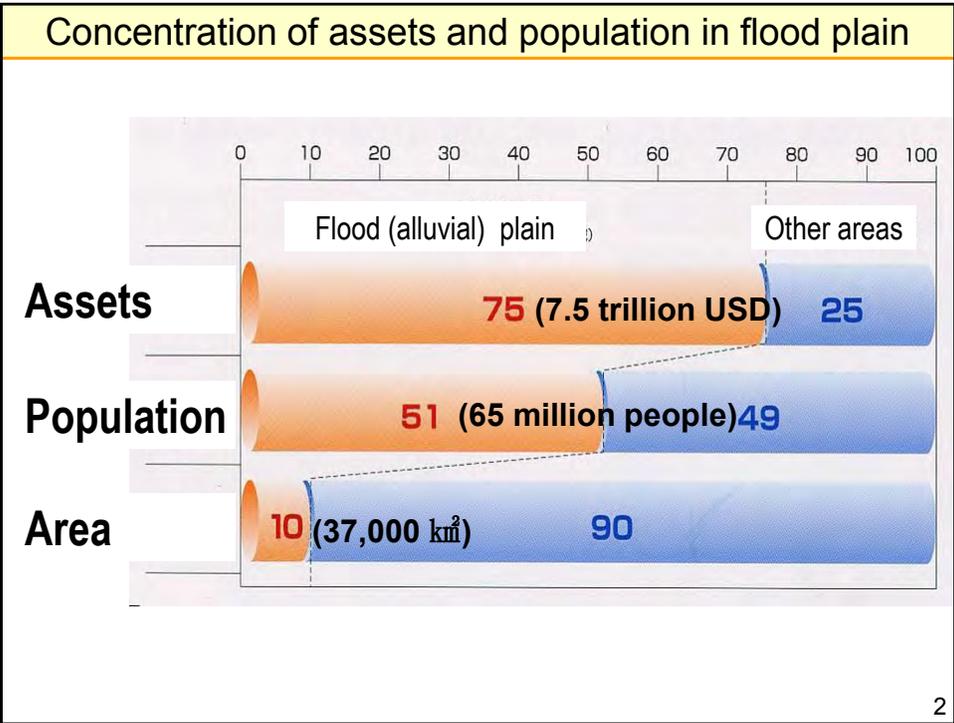
- Lessons and suggestions from Japan -

Kenzo Hiroki

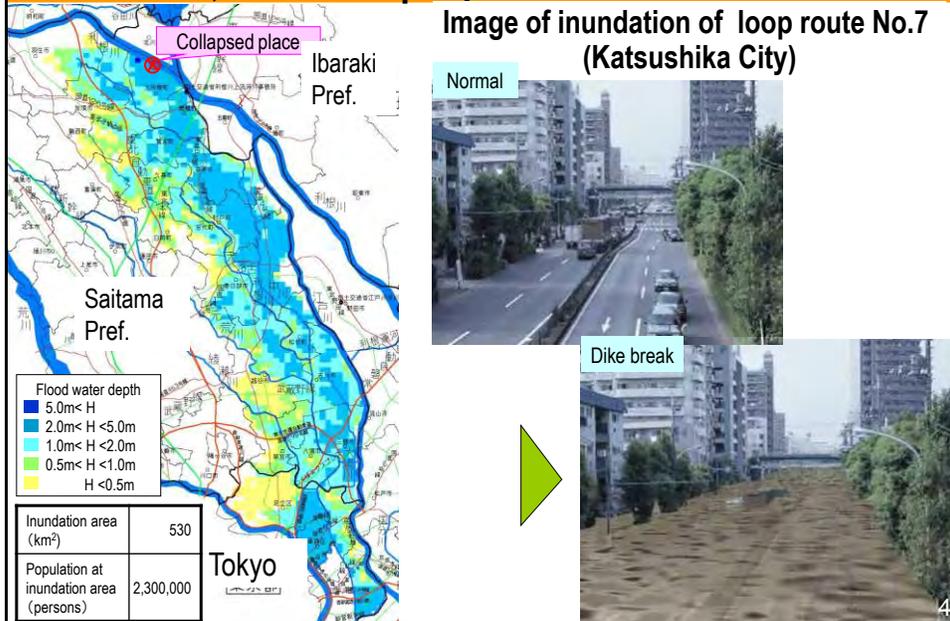
Vice President

**College of Land, Infrastructure, Tourism and
Transport (CLITT)**

**Why is Japan so keen on
Flood Management?**



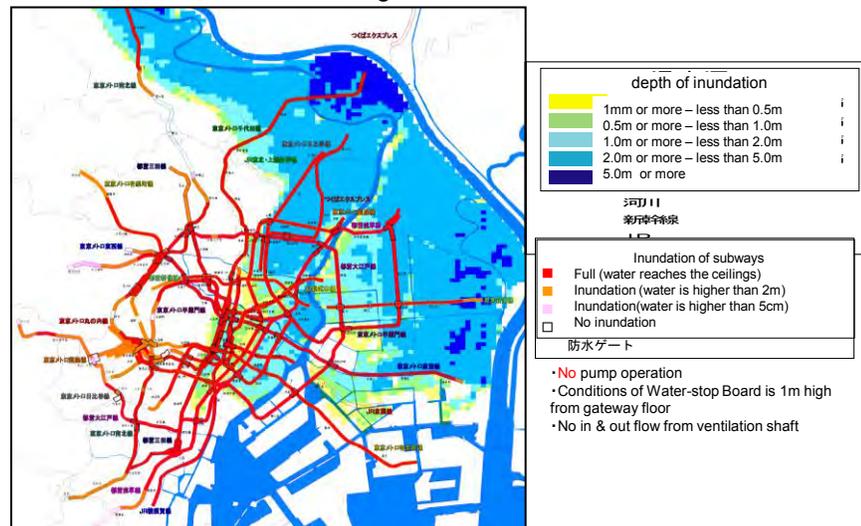
If Typhoon Kathleen (1947) hit again and break dikes of Tone River, 2.3million people can be under flood water



Spread of flooding through subway tunnels

- Underground shopping areas and buildings' underground can be inundated by flood water through subway tunnels
- The inundation will be more rapid and deep

Inundated area in case of the right dike of Arakawa River broken



Why is Japan so keen on Flood Management?

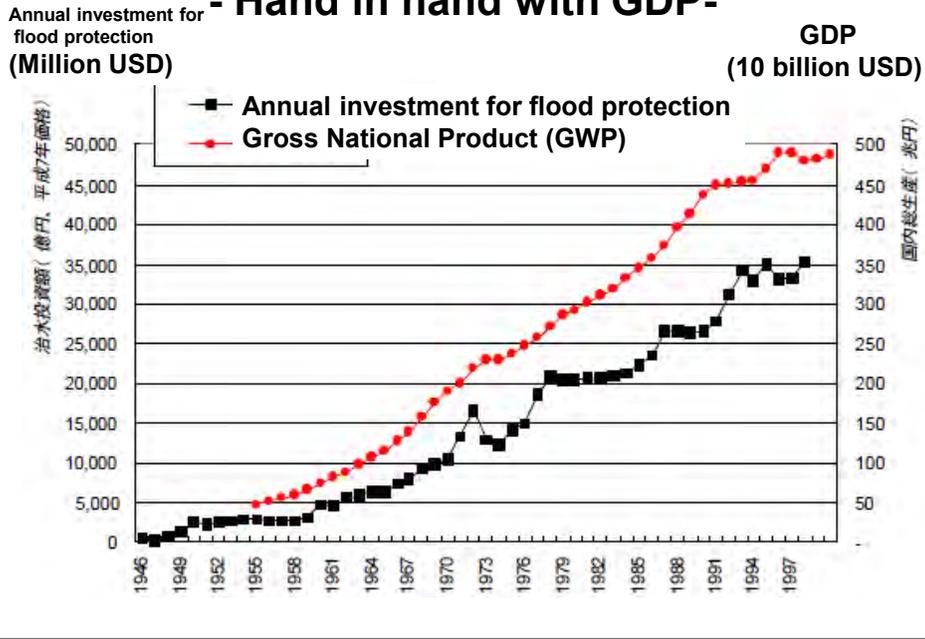


**Because it is, through history,
a matter of state survival**

**What we have achieved; and
What we have not
in national efforts of flood risk reduction**

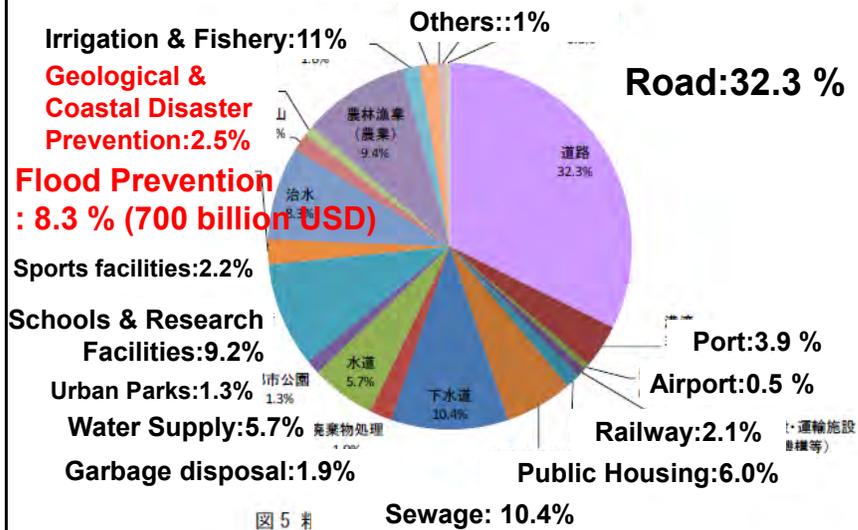
Investment in flood prevention

- Hand in hand with GDP-



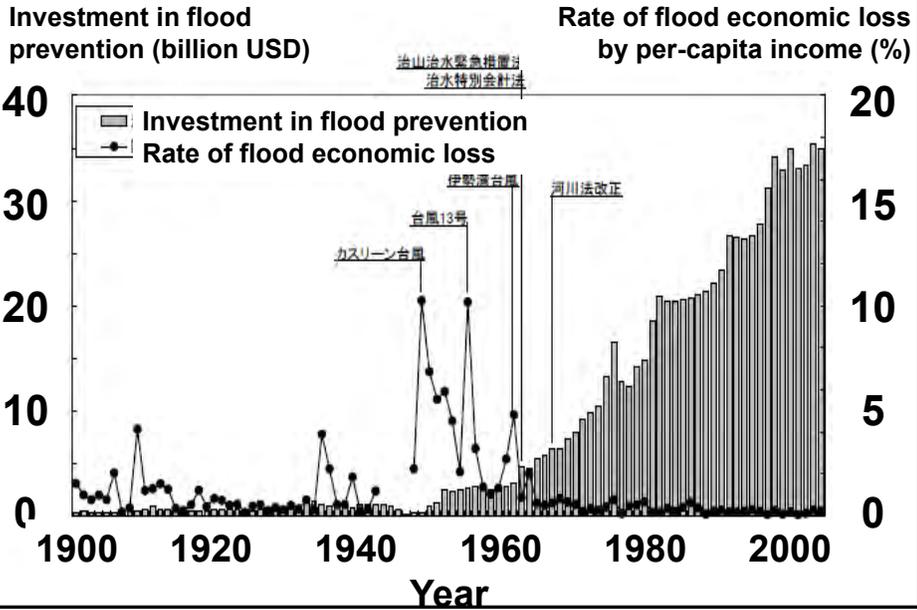
National Infrastructure Stock

Total Value: 8 Trillion USD



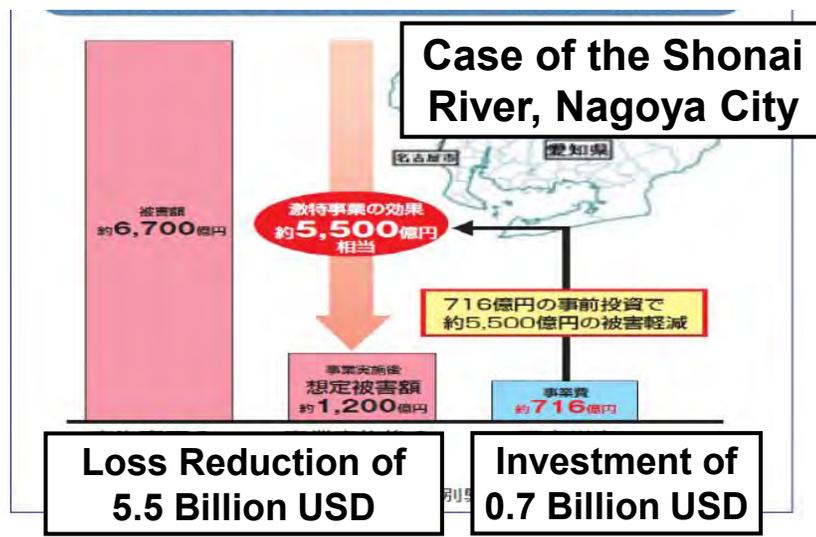
Steady investment led to decrease in disaster loss

Investment in flood prevention and flood economic loss in past 100 years

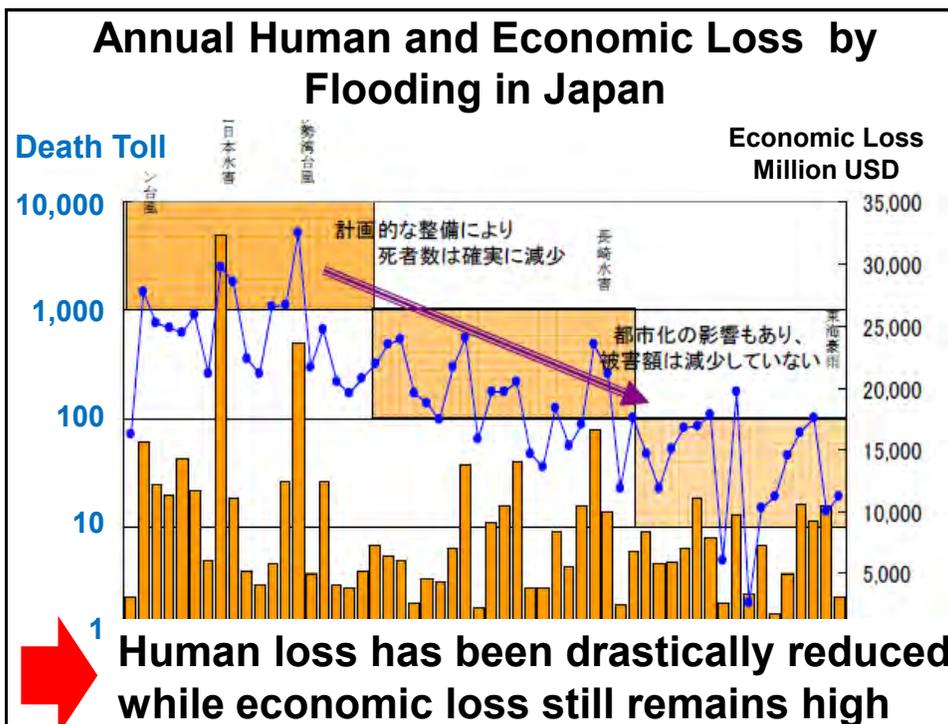


Prevention pays off

Every one dollar spent for flood prevention creates 8 dollars of loss reduction

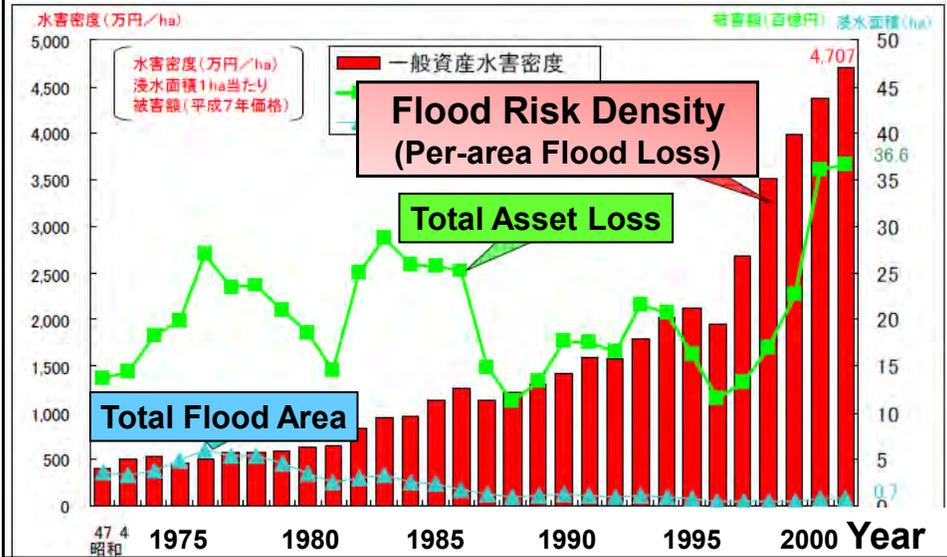


What we have not achieved

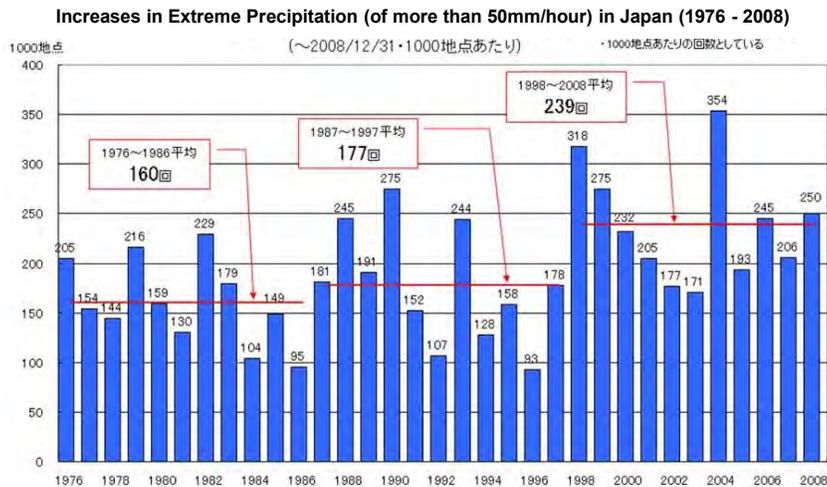


Catch me if you can

-Flood risk increases though flood area decreases -

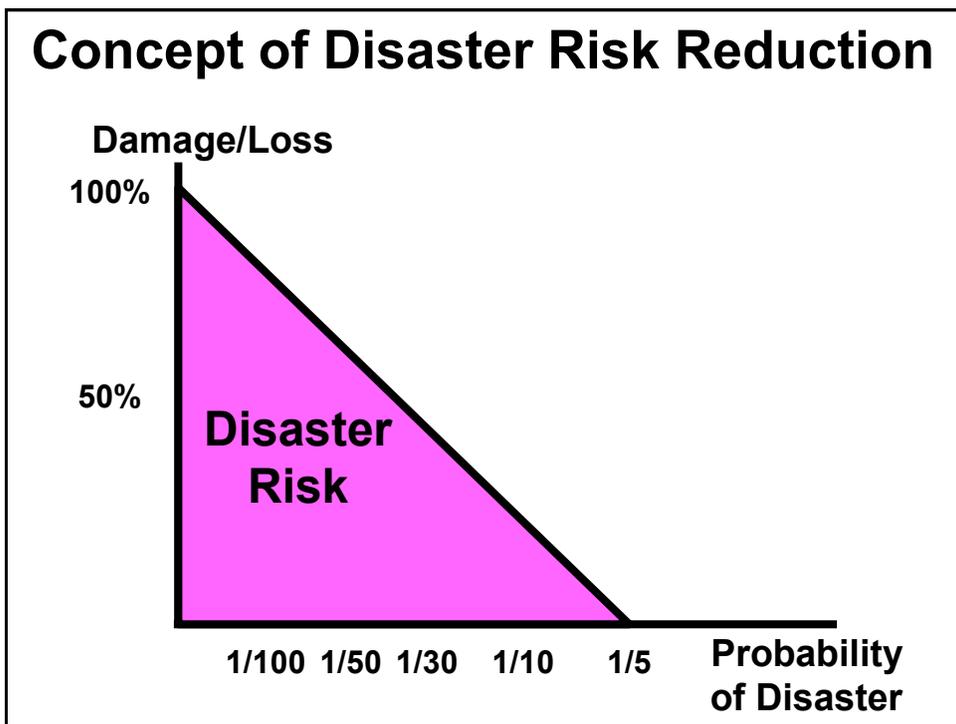


Increasing extreme hydrological events

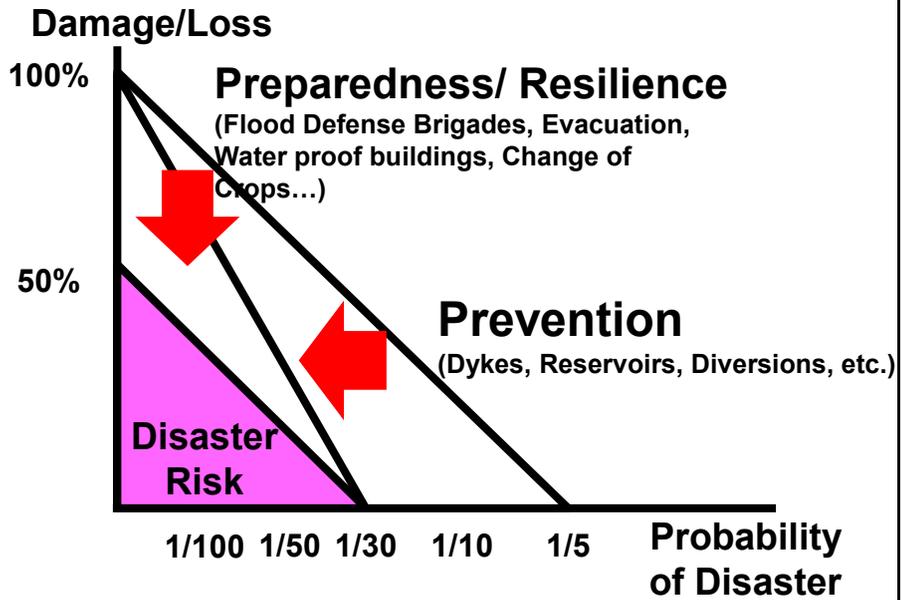


Frequency of heavy rain has increased by 50-100% in recent 20 years

Paradigm Shift in Flood Disaster Risk Reduction - to achieve what we have not -



Concept of Disaster Risk Reduction



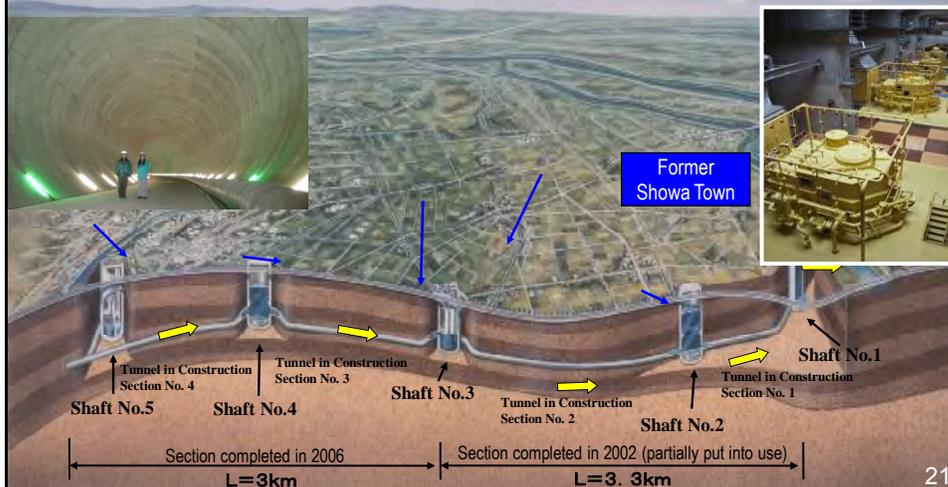
Paradigm shift in Flood DRR



Turning paradigm shift into reality

Metropolitan Underground Flood Diversion Scheme

Connecting lowland rivers by vertical shafts (70m in depth) and underground tunnel ($\Phi 11\text{m} \times 6\text{ km}$)
Divert and store flood water for later discharge



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Super Levee by PPP

- Super embankments have mounding in more extensive urban areas than existing embankments. The advantages of super embankments are:
 - 1) no collapse at floods,
 - 2) no collapse against inundation, and
 - 3) earthquake-resistant.
- River bank land development is strictly restricted pursuant to the River Law. However, the whole slopes at the back of super embankments are designated as the special areas, for which land development is deregulated.



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Developing retarding basins for flood management and ecosystem conservation



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Flood Protection Measures for Subways

1) Flood Protection Panels



2) Entrance Locks



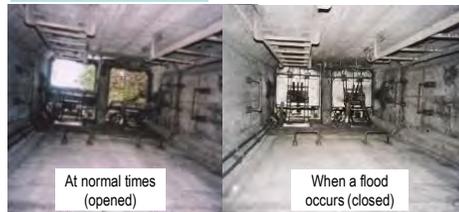
Entrance to a subway station on Tozai Line (Koto City)
The installation standard is to prevent floods at T.P. 1.0 m or higher.

3) Tunnel Locks



4) Automatic Ventilation Locks

Machines for preventing floods



* These pictures were taken from underground in the air vent, looking up to the ground surface.

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Preventing urban flood by storing rain water in community

permeable tile pavement



rainwater storage in community



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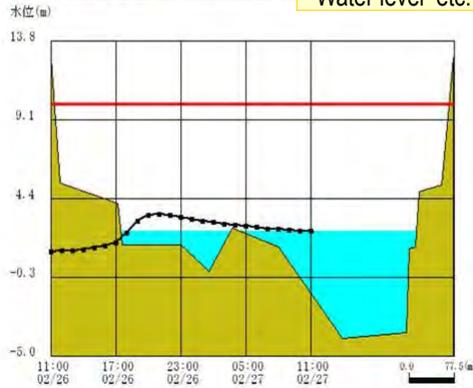
Provision of flood warning/information by mobile phone

Information provided on the internet

観測所別水位グラフ

| | |
|------------------|-------|
| 計画高水位 | 10.0m |
| 危険水位 | — |
| 特別警戒水位 | — |
| 警戒水位 | — |
| 指定水位 | — |
| 年月日時分 | 水位(m) |
| 2006/02/27 11:00 | ** |
| 10:00 | ** |
| 09:00 | ** |
| 08:00 | ** |
| 07:00 | ** |
| 06:00 | ** |
| 05:00 | ** |
| 04:00 | ** |
| 03:00 | ** |
| 02:00 | ** |
| 01:00 | ** |
| 2006/02/26 24:00 | ** |
| 23:00 | ** |
| 22:00 | ** |
| 21:00 | ** |
| 20:00 | ** |
| 19:00 | ** |
| 18:00 | ** |
| 17:00 | ** |
| 16:00 | ** |

| | |
|------|-------------|
| 水系名 | 吉野川 |
| 河川名 | 吉野川 |
| 観測所名 | 高杉橋 |
| 所在地 | 徳島県名西郡石井町高杉 |



※この概観は速報値であり、特定データではありません。

Information provided to mobile phones

Contents

- Precipitaion by hyeto meter
- Precipitaion by rader rain gages
- Water level etc.



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Hazard Map on Street

The assumed flood water depth is indicated using a tape.



ここは荒川の氾濫により4m以上浸水するおそれがあります (上の青いテープの高さ)

4.0m

洪水時避難場所 QRコード

だいさんいわぶちしょうがっこう
第三岩淵小学校

国土交通省荒川下流河川事務所・北区
<http://www.ara.or.jp/> 06.7

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Integrated Flood Management through River Basin Management Plan



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Lessons learned

- **Disaster management (prevention & preparedness) requires decades of unflinching commitment and implementation. Country needs to keep solid legal, administrative and financial foundation for years to achieve this.**
- **Disaster prevention pays off. The challenge is, however, to convince this to the people including leaders in “normal days” when disasters are not visible and imminent. Keeping institutional memories, inter alia, is the key for success.**
- **“Good preparedness” in society is easy to say but extremely difficult to maintain as human being forgets. Do not fall into the trap that “preparedness” is a (cheap) panacea to ensure disaster safety. It also has limitation of effectiveness as prevention does.**

Lessons learned (continued)

- **Best mix of prevention, preparedness and transfer for disaster management depends on diverse geographical, social, and financial situation of countries and communities. Step-by-step improvement learning from past disasters is shortest cut towards better disaster management.**
- **Transfer such as insurance is a good way for individuals and organizations to avoid “financial catastrophe” after disasters. However, transfer, per se, does not reduce disaster risks, particularly from national perspectives.. Examine geographical, social, and financial situation of country/community before deciding the best mix. Geographical situation is particularly important to decide best mix for flood management.**

Check list for a government

when investing in disaster management

- Beware that disaster management requires years of unflinching commitment and implementation -
- **Legal foundation (i.e. a system of laws for disaster management) that enables long-term planning, financing and implementation**
- **Budgetary system resilient enough to allow for stand-by budget line for “ rainy days”**
- **In-house group of financial, legal and technical officials with good governance that can turn money into actual safety against disasters.**
- **Public consensus that disaster investment pays off**
- **Leaders’ awareness that good disaster management is prerequisite for political survival**

Thank you

**OECD Conference on the Financial Management of
Flood Risk: Building Resilience in a Changing Climate**

**Australia's Natural Disaster
Funding Arrangements**

**Jonathan Coppel
Commissioner, Productivity Commission**

12 May 2016

Productivity Commission

What the Commission was asked to do?

Analyse the quantum, coherence, effectiveness and sustainability of Commonwealth and state government expenditure on natural disaster mitigation, resilience and recovery.

The funding arrangements matter because they impact on the incentives to manage natural disaster risks.

Specifically, the terms of reference asked us to consider:

- *Risk management measures*
- *Interaction with other Cwlth/state financial arrangements*
- *The balance of natural disaster recovery and mitigation expenditure*
- *Impacts of reforms and implementing reforms*
- *Roles of urban planning, land use policies and infrastructure investment*

Productivity Commission

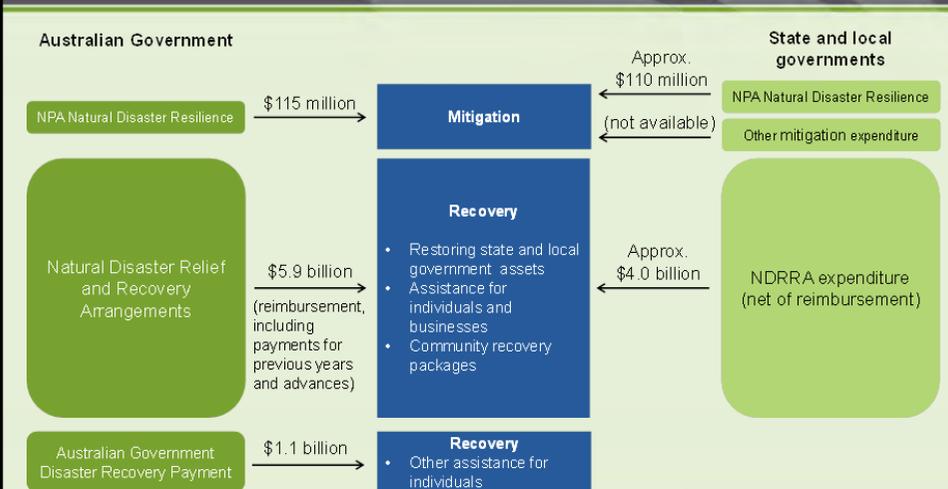
2

Flood risk in Australia

- Most significant natural disaster by insurance loss, averaging about A\$480 million per year since 1970, but bushfires have a larger human toll.
- Cyclone, flood, storm and hail account for:
 - **84% of insurance losses**
 - **63% excluding hail**
- Some states are more vulnerable to flood than others:
 - **100% of losses in QLD and NT**
 - **95% of losses in WA**
 - **80% of losses in NSW and 65 in Victoria**
- 10% of natural disasters account for 80% of losses

The major national natural disaster funding arrangements

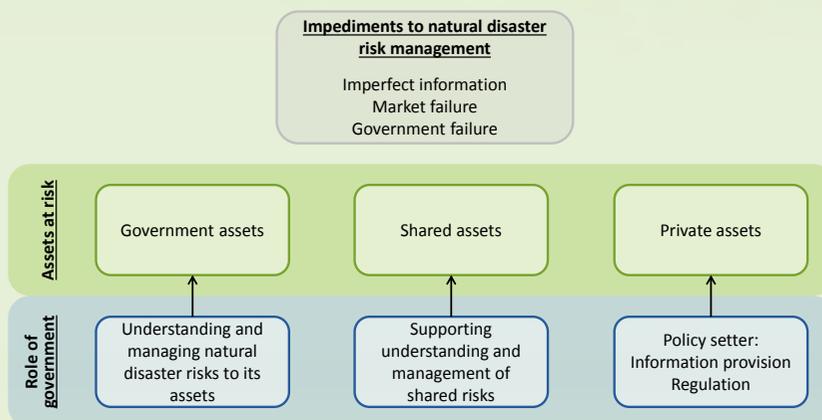
Expenditure for 2009-10 to 2012-13



Problems identified by the Commission

1. Overinvestment in relief and recovery
2. Underinvestment in mitigation
3. Underuse of insurance by state, territory and local governments
4. Inefficient reconstruction expenditure
5. Inequitable arrangements

Role of government in managing natural disaster risk



Managing government assets

- Principle that asset ownership should align with responsibility for managing and funding risk also applies to governments
- Across levels of government, the principle of subsidiarity applies
- Report recommended:
 - *Treat natural disaster risks transparently in budgets*
... Some base level of provisioning is needed
 - *Reduce Aust. Govt. post-disaster support to states*
 - *Increase Aust. Govt. support for mitigation*
 - *Move away from reimbursement model for cost sharing*
 - *Establish accountability frameworks that give states more autonomy for natural disaster risk management*
... Compile asset registers and develop long-term asset management plans

Managing shared assets

- Major disasters can overwhelm a community. Some degree of risk sharing with government can protect vulnerable populations and maintain social cohesion
- Disaster relief payments, volunteer effort and the existing social safety net each have a role to play
- These arrangements are inconsistently applied, inefficient in their administration, prone to overlaps and duplication and very costly
- Report recommended:
 - *legislate eligibility criteria and remove Ministerial discretion for special payments*
 - *Review level of special assistance to better reflect needs*
 - *Cease reimbursement for activities covered by other payments*
 - *Cease direct financial assistance to businesses and primary producers, but if post-disaster assistance is provided it should be through untied grants*

Managing private assets

- Government policy can influence the exposure and vulnerability of the community to flood risks
- Report recommended:
 - *Governments should make natural hazard information publicly available*
 - *Gaps relate to data consistency, accessibility and communication of hazards*
 - ... IP, liability, privacy act as obstacles to better information
 - ... Develop flexible guidelines for hazard mapping, modelling and metadata
 - *Integrate natural disaster risk management into regulation of the built environment*
 - *Explore opportunities for government–insurer partnerships to share information*

Lessons for natural disaster risk management

- More transparent budget treatment of natural disaster risks
- Greater and neutral incentives to invest in mitigation
- Accountability frameworks to reduce prescription and give states more autonomy on how they undertake recovery and mitigation
- Limit ministerial discretion over eligibility criteria
- Invest in information guidelines, provision and access and communication of risks
- Insurance is an essential risk management option

THANK YOU

<http://www.pc.gov.au/inquiries/completed/disaster-funding/report>

Flood Risk And Sovereign Ratings

Paris, May. 12, 2016

Moritz Kraemer
Global Chief Ratings Officer
Sovereign Ratings
moritz.kraemer@spglobal.com

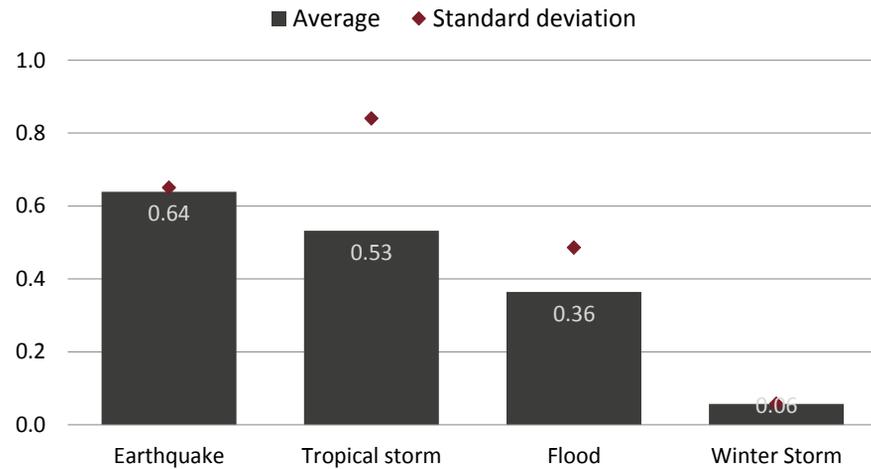
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Sources for all data: S&P Global Ratings



S&P Global
Ratings

Rating Impact Per Peril

(1-in-250-years disaster, in notches downgrade)

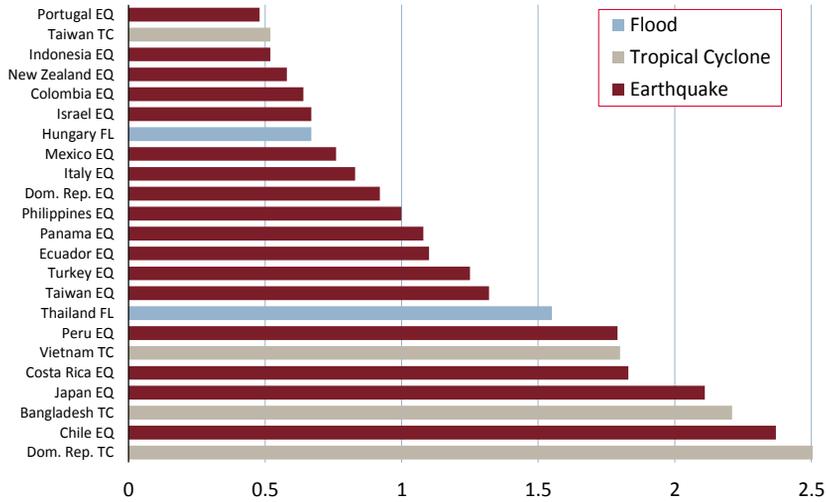


S&P Global
Ratings

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Hypothetical Sovereign Rating Impact

(1-in-250-years disaster, in notches downgrade)

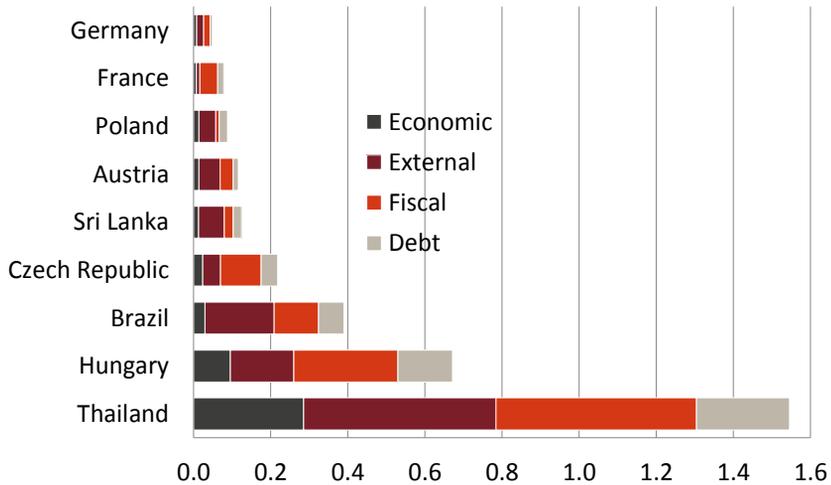


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3

Rating impact of floods, contribution by assessment

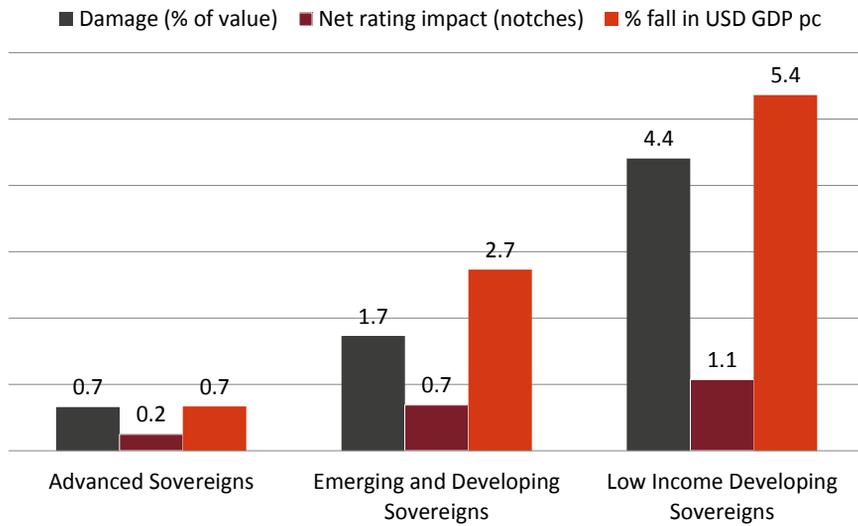


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Average NatCat Impact By Income Group

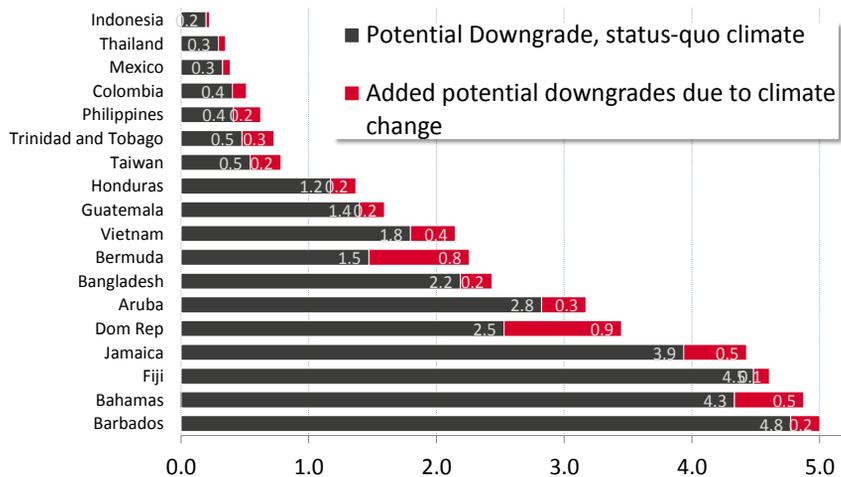


S&P Global Ratings

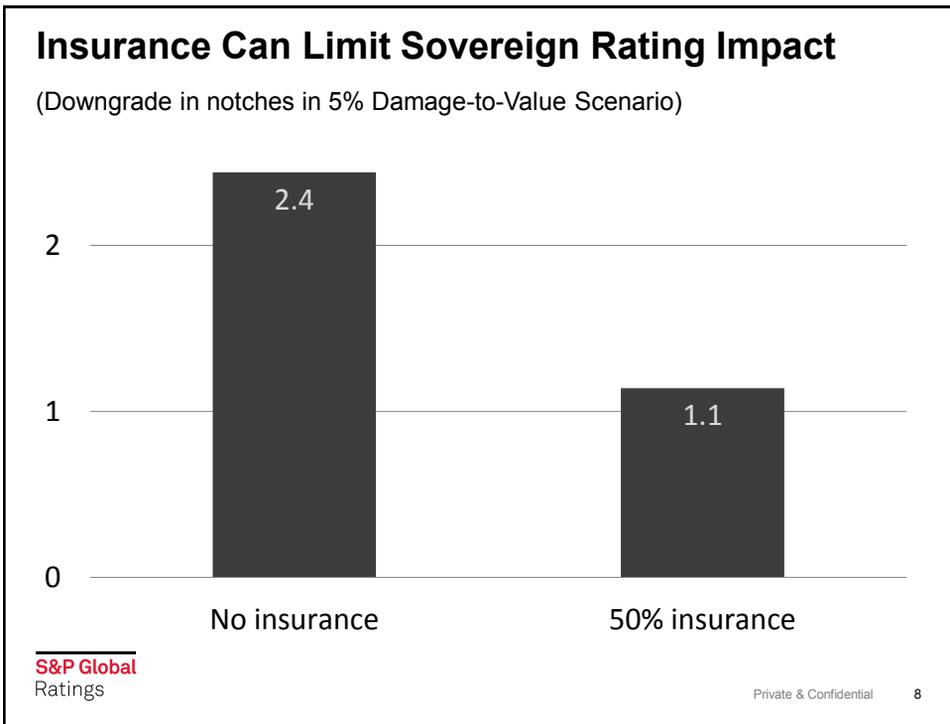
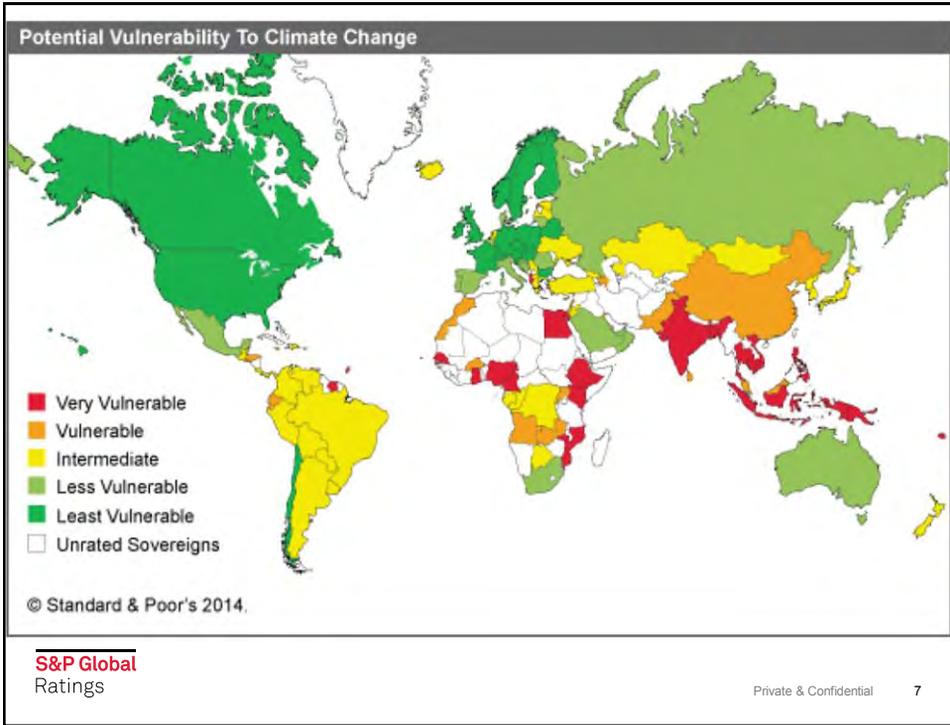
Private & Confidential

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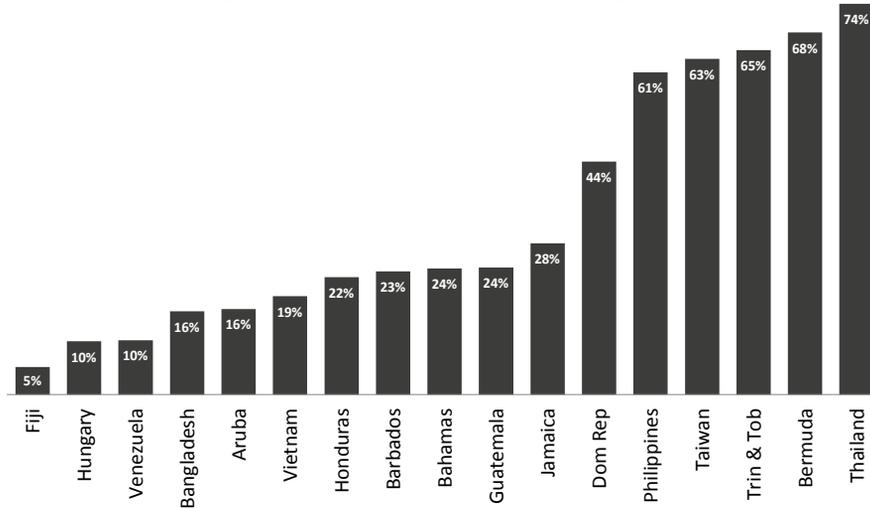
Downgrade Risk And Climate Change (in notches)



S&P Global Ratings



Added insurance coverage required to avoid climate change downgrades: too high for many



S&P Global Ratings



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