

Flood insurance – lessons from the private markets

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Global Facility for Disaster Reduction and Recovery

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Agenda

- Flood insurance and adaptation
- Insurance markets in practice; the United Kingdom
- New frontiers in flood risk financing
 - Case study; The Blue Wings catastrophe bond
 - Case study; Manggarai gate
 - Case study; ENSO forecast insurance

Insurance is a key pillar in any comprehensive strategy of adaptation to natural hazards

- Insurance:
 - ✓ increases resilience against residual risks that cannot be prevented or mitigated
 - ✓ can incentivize engagement and investment in risk mitigation measures
 - ✓ reduces pressure on the fiscal budget from natural disasters

Insurance markets struggle to provide affordable flood insurance in high-risk areas

- Even in many developed markets flood is an ‘uninsurable risk’ in coastal areas or on floodplains
 - High expected losses impair commercial viability of insurance
 - Many households at risk do not have access to affordable insurance

Insurance markets struggle to provide affordable flood insurance in high-risk areas

- It is common for the state to bear flood risk
 - State-backed insurance is common in developed countries with established private markets, it is also seen in developing countries
 - Where insurance penetration is low, governments bear the cost of flood risk through the provision of aid after an event

A private market in practice

The United Kingdom – 95% flood insurance penetration





Flood risk in the United Kingdom

- An estimated £200bn of assets at risk, one in six households at risk of flooding

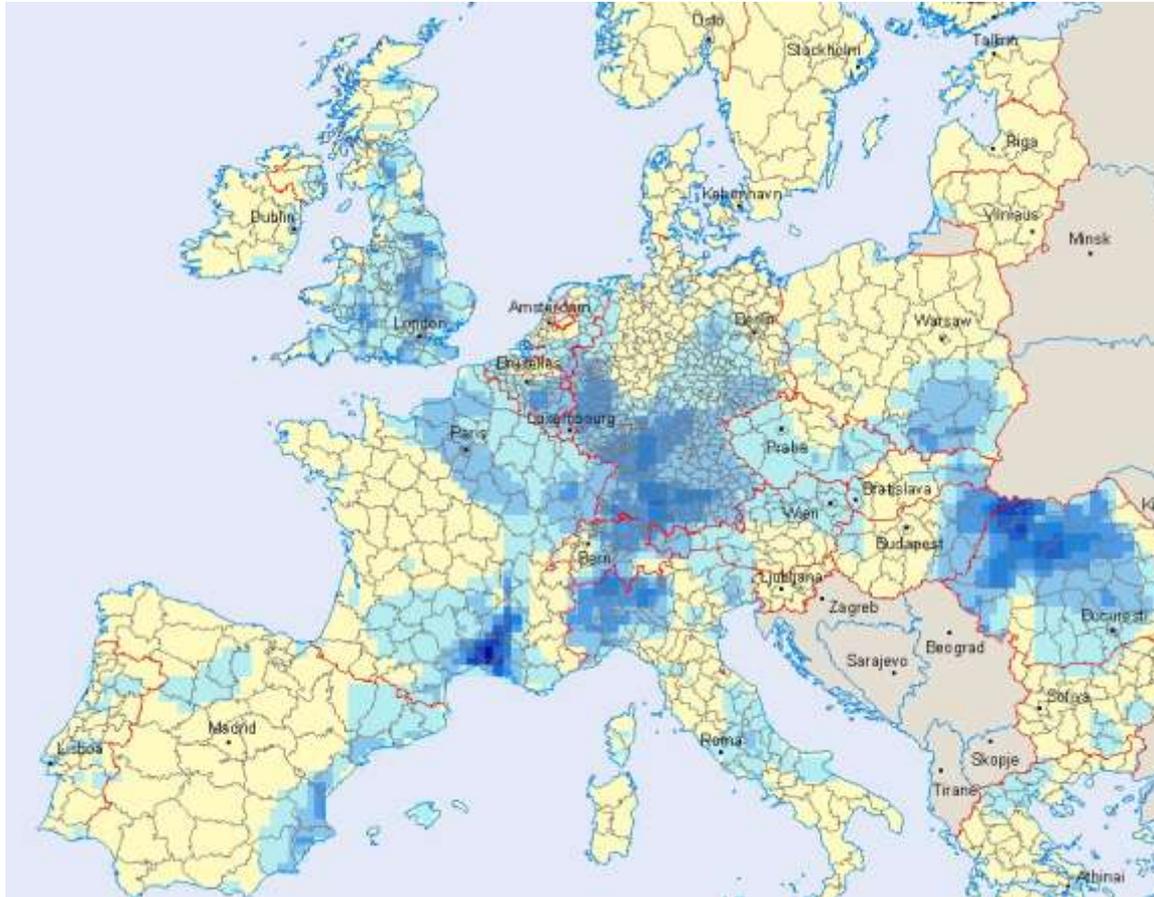
Source of flooding	Predicted changes in risk level
Flash flooding	Increasing use of 'hard landscaping' in the UK reduces natural drainage increasing risk of surface flooding/flash flooding
River flooding	Climate change may increase the frequency of extreme weather events that drive flood risk
Coastal flooding	Increases in severe weather as a result of climate change could increase frequency of storm surge events and coastal flooding

A private market in practice



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Flood risk in the United Kingdom



ESPON database; large river floods in Europe 1987 - 2002

UK – 95% flood insurance penetration

- No government subsidization of premiums or state-backed reinsurance
(all flood exposure is borne by the private sector)
 - Flood insurance widely available but not compulsory...
(cover offered as standard with home/commercial insurance packages)
- ...with manageable additional cost for those at highest risk...
(premiums are not prohibitively large for homeowners in high flood-risk areas)



How does the UK market work?

- Public-Private Partnership between the government and the Association of British Insurers (ABI)
 - Formal agreement for British insurers to continue to provide flood insurance in high risk zones
 - Conditional on 5-year plan by government to invest in defences to reduce vulnerability of high risk households
 - Excludes new buildings
- Insureds in low-risk zones share the cost of expected losses in high-risk zones





How does the UK market work?

- Insurers manage their exposure to flood losses by:
 - a) policy structuring to include excesses and coinsurance to promote individual risk mitigation
 - b) transferring risk to international reinsurance market
 - c) only insuring high risk properties in regions that will benefit from government investment in defences in the near-term



Challenges to sustainability

Operational:

- The absence of consistent risk models for flood makes portfolio accumulation management difficult
- Many international reinsurance programs are structured on a per-event basis, leaving frequency risk to domestic insurers



Challenges to sustainability

Public-private partnership:

- The industry-state partnership risks impeding the development of innovative insurance solutions for high risk areas
- Continued provision of affordable insurance for high-risk areas discourages individual engagement in risk mitigation

Should affordable insurance be available for high risk areas?

Lessons for markets in the developing world?

- Strong public-private partnerships can positively influence and guide public spending on risk mitigation and prevention
- Provision of non-State backed affordable flood insurance for high risk areas is feasible, but someone has to pay!
- Features of the UK flood insurance model are already being replicated in middle-income countries
 - risk sharing or 'solidarity' within the Romanian catastrophe insurance scheme



Potential for risk transfer into developed private markets

- Capacity to support flood risk is available in:
Domestic insurance markets → International reinsurance market → Capital markets
- Flood risk, as a diversifying peril, remains attractive to international reinsurers and capital markets investors
– *but typically for low frequency, high severity events*
- An established domestic insurance market is not a prerequisite for risk transfer
- Stable, high resolution data on flood risk is a prerequisite for risk transfer into any of these markets



New Frontiers in Flood Insurance

Case study: Blue Wings

- Transfer of \$150mn of UK river flood risk to capital markets investors
- First ever catastrophe bond to use a parametric flood trigger

Simple trigger mechanism

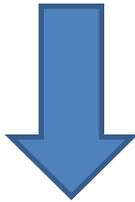


Case study: Blue Wings

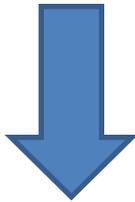


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50 locations selected across Great Britain as 'markers' for flood depths



Engineering firm engaged to measure height of water marks on buildings at 'markers' post event



Index calculated based on flood depths as a proxy for insured loss



Case study: Blue Wings

- Applicability of Blue Wings model to developing countries?

PROS

- Low tech measurement of flood depths = low cost monitoring, wide availability of required skills
- Simple transparent solution attractive to potential investors
- Developed domestic insurance market not a prerequisite for risk transfer

CONS

- Detailed probabilistic flood model required
- Consensus on level of risk presented by model required
- Potential for significant basis risk – geographic distribution of assets and quality of model determine viability

Case study: Manggarai gate



- First ever flood microinsurance scheme
- Launched by Indonesian insurer Asuransi Wahana Tata, Munich Re, and German aid agency GTZ, in Jakarta

Simple trigger mechanism

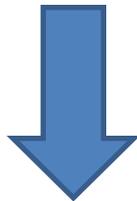
Case study: Manggarai gate



Manggarai Water Gate in Jakarta selected as 'marker' for hazard



Jakarta residents purchase a 'protection card' for around \$5 – an alternative to an insurance policy



If waters rise to or above 950cm at the gate, cardholders can claim a one-off payment of around \$25



Case study: Manggarai gate



- Outcome
 - in its first month, approximately 50 policies were sold and sales did not increase significantly in the following months
 - scheme discontinued in 2010
- Contributing factors?
 - perception of basis risk was high within the community
 - flood mitigation projects in the area reduced risk

Case study: ENSO forecast insurance



- Parametric forecast insurance linked to the El Niño Southern Oscillation (ENSO)
 - ENSO is characterized by warm sea surface temperatures in the Eastern Pacific - which causes severe flooding in Peru
- Targeted at risk aggregators (currently in Peru) such as agricultural lenders
- The first insurance to use a sea surface temperature trigger; the first regulated forecast index insurance product
- Currently being marketed

Case study: ENSO forecast insurance

The average sea surface temperature is measured across November and December



Where this breaches a predetermined threshold, a payment is calculated that increases linearly between the threshold and 27 degrees



Payments are released in January just prior to floods, and total values vary according to amount of cover purchased

Case study: ENSO forecast insurance

PROS

- By targeting lenders as opposed to individuals, basis risk is less of an issue
- NOAA data will be used to trigger the product; the experience of NOAA in this area is internationally recognized
- Developed domestic insurance market not a prerequisite for risk transfer

CONS

- High risk of adverse selection
- Basis risk will still be present in the product
- Issues such as adverse selection may make the cost prohibitive