



Flood-resilient cities start at home

KEY POLICY MESSAGES

- Learning to 'live with the flood' instead of 'fighting the flood' starts at home – on private land.
- The law has a strong influence on how homeowners respond to floods.
- Risk communication is not just about informing citizens, but also clarifying public and private responsibilities.
- Fair distribution of benefits and burdens requires coordinated private action and public regulation.

■ Schleching (DE), 2013
© Harald Hartmann.

Water International Policy Briefs (blue series) are based on thematic special issues of IWRA's journal and published with the support of Routledge Press. They aim to provide high quality analysis and practical recommendations for policy makers on important development issues.

• Access *Water International* by becoming a member of IWRA: www.iwra.org

• or subscribe only to the journal at: www.tandfonline.com/toc/rwin20/current

IWRA, as a neutral forum, does not necessarily endorse the views expressed herein.





■ Venice, 2019
© Thomas Hartmann.

Flooding is an expensive climate-related disaster and a threat to urban life. Climate change will increase flood frequency and scale. Continuing developments in flood-prone zones compound the risks. Protecting all properties to the same standards is ever more challenging.

Research has focused on improved planning and adapting publicly owned infrastructure such as streets, evacuation routes, and retention ponds. Damages often happen on private land. To realize a flood-resilient city, owners of privately owned residential houses also need to act.

Measures such as mobile barriers and backwater valves or avoiding vulnerable uses in basements can make homes more flood-resilient. But private owners may be unaware of flooding risks or lack the means and knowledge to act. Incentives may be insufficient, while fragmented and responsibilities entrench inertia. The challenge is motivating homeowners to take steps.

Political and societal systems influence the action citizens are prepared to take and what they expect their governments to do. The responsibility for implementing measures is shared between the public and the private domain in different degrees in different countries. This special issue explores and discusses the division and balance of responsibilities between the public and the private.

LEVEES CREATE DILEMMAS

Levees are meant to offer protection against flooding. At the same time, levees create a paradox. Building a levee may induce more property investment, increasing the damage should the levee breach. Building stronger levees to reduce that risk in turn potentially increases the risk by encouraging more development. The result is a spiral of ever-increasing dependence on levees and increasing expenditure.

Ferdous et al. show the paradox holds true both in high-income countries like the Netherlands and low-income countries such as Bangladesh. Levees allow the Netherlands to be inhabited, while in Bangladesh, levees on Brahmaputra/Jamuna River floodplain shape socioeconomic advantage and migration.

Spiralling costs have led to 'soft' policy recommendations, prevention, preparedness, emergency response and recovery after flooding. 'Soft' measures prioritise natural capital, community control, simplicity and appropriateness, while 'hard' engineering is capital-intensive, large, inflexible and complex (hence out of community control).

Flood risk management requires both hard and soft measures. Trade-offs between the advantages and disadvantages should be considered carefully. Resilience requires risk management to be integrated with other policies, in particular land-use planning.

COMMUNICATION ONLY GOES SO FAR

Communication is essential to motivating homeowners but limited in its effectiveness. No one approach fits all, given how different households perceive risk.

In a pilot project in Flanders, Belgium, Flanders Environmental Agency experts gave free, tailor-made advice on floodproofing to homeowners in a high-risk area. Davids et al. found a few decided to adapt their house based on the advice. Most felt better informed, but still held government responsible.

Some blamed government for allowing increased urban development, or their homes to be built in a flood-prone area in the first place. Others pointed to the lack of government support in this shift of responsibilities and how difficult it was to achieve what was advised. They were willing to act only if the local government acted also.

The study showed tailored advice did not overcome the deadlock, partly because the experts decided what homeowners needed to know in terms of probabilities. Residents were left with a very limited sense of what they should or could do. It raised anxiety about risks beyond their control rather than triggering adaptation.

Residents preferred to know the likely impact and consequences of floods on their well-being and property.

The mismatch between residents' risk perception flood experts' water management illustrates how people 'hear' and understand the same information in different ways. Snel et al. highlight the need for diverse communications styles and messages to cut through to all participants.

RESPONSIBILITY TREADS A FINE LEGAL LINE

As floods become more frequent, intense and damaging, technical preventative solutions are less effective. Policies to improve cities' flood resilience must address private property issues, either because private properties are affected or because they can be part of the solution.



■ Bolts on the facade prepare houses for mobile barriers in case of rising water levels. Dresden, 2019. © Thomas Hartmann.

URBAN RENEWAL CALLS FOR 'SPONGE' CITIES

After a century of a moderate flood activity, Central Europe experienced several extreme floods at the turn of the millennium. Yet, Raška et al. found that flood risk management rarely figures in redevelopment plans to address population and economic decline in some cities since the fall of Communism.

Clearing abandoned industrial sites and homes in flood-prone zones can free up land to act as a 'sponge', making the rest of the city safer and more attractive for investment. Case studies in three Czech cities, Ústí nad Labem, Ostrava and Olomouc, show this is easier said than done, however.

Post-Socialist urban planning relies on a steady-growth paradigm. City authorities and private companies treat urban decline as a problem of restoration rather than an opportunity to change land use. Neither can agree on the best way forward. Weak institutional design and insufficient finance compound the inertia.

The EU Floods Directive (EC 2007/60/EC), calls for a multilevel, decentralised approach involving land and homeowners. In Central Europe, fragmented and disputed land ownership weakens central governments' capacity to coordinate flood risk management, even though the public continues to see it as a state responsibility.

The dilemma intensifies the tension between urban economic renewal goals and redesigning Central European cities to live with floods rather than trying to stop them.



Flood resilience rests on the definition and balance of homeowners' and public authorities' responsibilities. Rauter et al. and Jacobson describe how the legal context, whether common law, civil law or another system, influences flood resilience measures. But these measures face limits in addressing the fraught relationship between government responsibility and individual property rights.

While it is the state's responsibility to communicate flood risk, in most countries it is the property owner's responsibility to implement protection measures on private land. Conflict arises when owners are denied certain land uses or additional conditions on use are imposed. Information on measures to protect private property from natural hazards is often limited, and hence the legal responsibility of the affected people is low.

Authorities have a responsibility to communicate accurate information to property owners. If respective legal responsibilities are unclear and poorly communicated, homeowners will not play their part in improving flood resilience.

NEXT STEPS

Whether cities can live with floods instead of fighting them depends on providing space to mitigate their scale and impact. Private property owners have an important role to play in creating urban floodplains that are more resilient to inundation.

Planning and policy makers need to realign their efforts in ways that motivate homeowners to engage despite institutional and regulatory fragmentation. How to do this is still an open question, but finding an answer is imperative.

■ Schwerte (DE), 2008
© Uwe Grützn.

REFERENCES

From: *Water International* Special Issue: Flood resilience of private properties, Volume 44, No. 5, July 2019,
www.tandfonline.com/toc/rwin20/44/5

Thomas Hartmann, Willemijn van Doorn-Hoekveld, Marleen van Rijswick & Tejo Spit. *Editorial.*

Md Ruknul Ferdous, Anna Wesselink, Luigia Brandimarte, Giuliano Di Baldassarre & Md Mizanur Rahman. *The levee effect along the Jamuna River in Bangladesh.*

Pavel Raška, Monika Stehliková, Kristýna Rybová & Tereza Aubrechtová. *Managing flood risk in shrinking cities: dilemmas for urban development from the Central European perspective.*

Peter Davids, Luuk Boelens & Barbara Tempels. *The effects of tailor-made flood risk advice for homeowners in Flanders, Belgium.*

Karin Snel, Patrick Witte, Thomas Hartmann & Stan Geertman. *More than a one-size-fits-all approach – tailoring flood risk communication to plural residents' perspectives.*

Magdalena Rauter, Arthur Schindelegger, Sven Fuchs & Thomas Thaler. *Deconstructing the legal framework for flood protection in Austria: individual and state responsibilities from a planning perspective.*

Thomas Jacobson. *Too much water, not enough water: planning and property rights considerations for linking flood management and groundwater recharge.*

L. Dai, W. J. van Doorn-Hoekveld, R. Y. Wang & H. F. M. W. van Rijswick. *Dealing with distributional effects of flood risk management in China: compensation mechanisms in flood retention areas.*

C. B. R. Suykens, D. Tarlock, S. J. Priest, W. J. Doorn-Hoekveld & H. F. M. W. van Rijswick. *Sticks and carrots for reducing property-level risks from floods: an EU-US comparative perspective.*

ACKNOWLEDGEMENTS

The research contributes to the EU COST Action LAND4FLOOD on Natural Flood Retention on Private Land (CA16209, www.land4flood.eu) and has been supported by the project "Preparing urban private property for floods: resilience and recovery in built up areas" of the "FUTURE DELTAS" programme of Utrecht University, the Netherlands.

WI Special Issue Editors: Thomas Hartmann, Willemijn van Doorn-Hoekveld, Marleen van Rijswick and Tejo Spit.

IWRA Policy Brief Editors: Claire Miller and James E. Nickum

Layout: Nathalie Lyon-Gaen