

Risky Environments: Governance and Adaptation for Future Flood Risk

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Abstract

Modern environments are becoming increasingly risky. Climate change, population growth and the spread of urbanisation have increased flood risks, such that the vulnerability of populations to the natural hazard, and the financial cost of response and recovery have increased in association. In response, flood governance is changing. This study presents the results of a comparative case study of flood risk governance and management that aimed to address two research questions, (i) what are the key challenges of flood management in consideration of the role of the governance framework, local context and stakeholder perception and acceptance of risk at multiple scales and (ii) what are the options for an adaptive management approach to flood?

The research design employed components of grounded theory and a comparative case study methodology to explore approaches to flood management in three different case studies across local, regional and national scales: 1) The development of the Brownhill and Keswick Creek Stormwater Management Plan in South Australia; 2) The governance response to the 2011 floods in south-east Queensland, and; 3) the implementation of the *Flood Risk Management (Scotland) Act 2009* in Scotland, United Kingdom. Ulrich Beck's Risk Society (1992) was applied as a philosophical lens to construct the conceptual understanding of 'risk'.

Findings reveal a diversity of approaches to the management of future flood risk across scales. Each case study and scale (local, regional and national) highlighted different aspects and challenges of flood management around the themes of governance (e.g. diffused and unclear responsibilities and accountabilities), adaptation (e.g. relocation, natural flood management and use of landscape) and underlying risk perception. The three case studies together provide a critical comparative analysis of the key challenges faced by managers of flood risk.

Concluding recommendations highlight that common challenges for flood management are constructed around: urbanisation; climate change; governance of systems; risk perception; and uncertainty from increased flood risk. The case studies demonstrated that the link between a new framing of risk and the practical consequences for implementation need to be strengthened for effective community empowerment and resilience. Increased community resilience requires multi-disciplinary, cross-scale understanding, where local communities can imprint their values and risk perceptions on the decision-making process. A transition towards a sustainable flood risk management paradigm will be required for communities to adapt to their new risky environments.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Acronyms and Abbreviations

ABI – Association of British Insurers

AEP – Annual Exceedance Probability

AHD – Australian Height Datum

ARI – Average Recurrence Interval

BHKC – Brown Hill and Keswick Creeks

The Bureau – Bureau of Meteorology (Australia)

CBD – Central Business District

CEO – Chief Executive Officer

CRESS – Centre for River EcoSystem Science (University of Stirling, Scotland)

COSLA – Convention of Scottish Local Authorities

CPI – Consumer Price Index

DEFRA - Department for the Environment, Food, and Rural Affairs (England and Wales)

DEWNR – Department of Environment, Water, and Natural Resources (South Australia)

DFL – Defined Flood Level

DPTI – Department of Planning, Transport and Infrastructure (South Australia)

EU – European Union

***Floods Directive** - Directive 2007/60/EC on the assessment and management of flood risks*

***FRM Act 2009** – Flood Risk Management (Scotland) Act 2009*

***FWM Act 2010** – Flood and Water Management Act 2010*

GB – Great Britain

ICA – Insurance Council of Australia

Inquiry – Queensland Floods Commission of Inquiry

IPCC – Intergovernmental Panel on Climate Change

ISO – International Organisation for Standardisation

LVRC – Lockyer Valley Regional Council

NGO – Non-government organisation

NR AMLR - Natural Resource Adelaide and Mount Lofty Ranges

NSW – New South Wales

OECD - Organisation for Economic Co-operation and Development

PCWMB - Patawalonga Catchment Water Management Board

PMF – Probable Maximum Flood

PPRR – Prevention, Preparedness, Response and Recovery

QLD – Queensland

QRA – Queensland Reconstruction Authority

Review - Natural Disaster Insurance Review: Inquiry into flood insurance and related matters.

RSPB – The Royal Society for the Protection of Birds (United Kingdom)

SA – South Australia

SAFECOM – South Australian Fire and Emergency Services Commission

SAIFF – Scottish Advisory and Implementation Forum for Flooding

SE – South east

SEQ - South east Queensland

SES - State Emergency Service

SEPA – Scottish Environment Protection Agency

SMA – Stormwater Management Authority (South Australia)

SMP – Stormwater Management Plan

SNH – Scotland Natural Heritage

SPP – State Planning Policy

SNIFFER – Scotland & Northern Ireland Forum for Environmental Research

SUDS – Sustainable Urban Drainage Systems

UK – United Kingdom

UNISDR - United Nations Office for Disaster Risk Reduction

USA – United States of America

WSUD – Water Sensitive Urban Design