CREW CENTRE OF EXPERTISE FOR WATERS

Policy to Preparedness: Flood policy and community engagement

Policy Brief

Fiona Henderson, Rachel Dohain-Lesueur, Bridget Bennett, Karin Helwig and Zarina San Jose

GCU Glasgow Caledonian University

Scottish Government gov.scot

CREW CENTRE OF EXPERTISE FOR WATERS

Key Recommendations

- **There is a pressing need to consider prioritising and coordinating flood issues in all local plans and strategies;**
- **The compounding of physical flood exposure and social vulnerabilities must be further investigated in the Scottish context and better understood to avoid increasing inequities;**
- **Metrics to measure impact should be developed to monitor the success of policy-driven actions intended to equitably increase flood resilience in all communities;**
- **Investment in new knowledge and expertise, finances, and resources at local level is required to ensure everyone can participate in Scotland's flood resilient future.**

Summary

This CREW Science Policy Fellowship investigated the interconnectedness of policies relevant to pluvial and fluvial flood exposure and management. It contextualised that analysis within the latest academic research on social perceptions, preparedness behaviours, and the engagement of communities with flood resilience.

The research concluded that recent flood-related policies are beneficially interconnected at regional, Scottish and UK levels, and that the egalitarian approach evident within them is supportive of climate and social justice. However, while egalitarian approaches are the ideal when pursuing climate and social justice, such policies face a complex test when they are implemented amongst existing inequalities in society.

Research undertaken

Evidence was collected by mapping and analysing UK, Scottish and regional policies. Simultaneously, a scoping review was also conducted that focused on papers published since 2020 (with some exceptions), supplementing a large rapid evidence assessment of the literature conducted up to 2020[1]. The policy mapping included legally-binding acts and regulations alongside non-binding strategies and plans in accordance with the Scottish Government's definition of *policy*[2]. In total, 28 national (Scottish and UK) policies and 46 regional (local authority-level) policies were mapped, covering a variety of fields (*Appendix 1 – The Policy Map*).

The literature review searched Scopus using a transparent replicable methodology to facilitate future updates. The search targeted papers on flood management policies, governance and decision-making, community engagement, risk perception, resilience and adaptation behaviour. A workshop to discuss the project's interim findings and reflect upon the policies selected, including their application in practice, was held in February 2024 The resulting discussions with expert participants drawn from a range of flood specialisms and key organisations were consistent with the findings from the scoping review and policy analysis (See the appendices for the workshop visual minutes).

Key Findings

Flood-related policies

The policy analysis concluded that the policies driving Scottish community flood resilience, including the Flood Risk Management Act (2009), are socially innovative. They embody an emerging egalitarian Scottish flood policy paradigm, highlighting a shift away from historic UK paternalistic policies which prioritised state response over place-based approaches[3]. The policy analysis concludes that this egalitarian paradigm prioritises communities as key stakeholders in place-based flood resilience, and encourages greater individual and community responsibility for adaptation.

The analysis also concludes that there are beneficial synergies between post-2009 policies as a result of this egalitarian paradigm, including those that are not directly flooding-focused. For example, this equitable egalitarian ethos is reflected within the Community Empowerment Act (Scotland) 2015 and the Scottish Government's adoption of the Place Principle in 2019. It is also reflected in flooding-focused policy, including the ongoing commitment to community engagement within the Flood Risk Management Plans 2022–2028.

Recent policies were also found to prioritise adaptation and preparedness, moving on from a traditional focus on prevention to target and prioritise upstream adaption to flood exposure. A key example of this is found in the National Planning Framework 4 (NPF4), which now minimizes development in areas of high flood exposure. The NPF4 also embodies another key evolution in policy approach since the Flood Risk Management Act (2009), namely the integration of flood exposure within planning policies at national and regional level which are then carried through into the local development plans across Scotland's 32 local authorities.

Older UK policies like the Civil Contingencies Act 2004 (CCA), and the associated CCA (Contingency Planning) Regulations 2005, previously focused only on the state response in times of crisis. Today, these prescriptive policies are implemented with an associated egalitarian narrative that enables them to support rather than conflict with later policies. For example, there is now an importance placed upon community groups as volunteers in local emergency resilience[4] which was not emphasized as such in the CCA nor its associated Regulations.

The policy analysis found flooding was included in multiple strategies and plans but uncovered difficulty in determining where the priorities lay during their implementation phases. Diverse strategic agendas and targets across organisations, even when implementing the same policies, were found to have the potential to result in competing priorities. While the intended policy goal may be partnership-working, these competing priorities during implementation could inadvertently support siloed adoption. For example, in the Glasgow Development Plan, flood resilience is one of multiple goals and is not an overarching priority in the activities and interventions devised. The Plan's Green Network provides a multitude of functions simultaneously, including integrated habitats, active travel, and water management, but also acknowledges that not all goals can be met in every location. As a result, other goals may take priority over flooding and surface water management, despite the climate emergency increasing exposure risks. The policy analysis concludes, therefore, that there is a pressing need to consider prioritising flooding in local plans and strategies.

Distribution of flood exposure

Flood exposure is not fair nor equal in its environmental distribution across populations[5,6]. Environmental justice theories emphasise that this inequity in distribution increases the challenges and disadvantages that communities already face from pre-existing inequalities of resources[7]. Therefore, the distribution of flood exposure across communities and within different groups must be considered in order to adapt to flood exposure and mitigate exposure wherever possible[8].

Historically, policy did not effectively manage flood exposure in the UK, particularly the risk faced by those in marginalised groups and low incomes. In England and Wales, over 120,000 new homes were built in flood-prone areas between 2008 and 2018, an average of approx. 17,000 new homes per year, 90% of which were spatially concentrated within 10% of their local authority areas[6]. A disproportionate over-representation of both lower socioeconomic and multi-cultural groups was found in these new communities[6]. While as yet their is no similar analysis in Scotland, this evidence demonstrates how planning policy can compound the impacts of physical exposure with pre-existing social inequities.

The consequences of intentionally building low-cost housing in high flood exposure areas can not only become systemic e.g. through increased insurance premiums, mortgage defaults and bankruptcy, but also social e.g. loss of trust; community disengagement[6].

To avoid these systemic impacts and to better understand inequities in the distribution of flood exposure, policy support is needed to avoid compounding inequities. One approach to assisting policymakers to visualise these risks is through overlaying mappings of vulnerabilities on flood maps to focus efforts where the two coincide. Mapping vulnerabilities to flooding is covered extensively in the current literature, with a plethora of approaches and resilience indexes to support this across multiple cultures and countries[9,10,11]. In Scotland, the Scottish Index of Multiple Deprivation (SIMD) is now being used to overlay flood-exposed areas to assist in decision-making at local level e.g. in Edinburgh[12]. However, metrics are yet to be developed to establish how effective this visual approach is and whether any resulting actions have the desired impacts.

Individual flood resilience

Almost a decade ago, research established that deprived Scottish neighbourhoods are at higher risk of being located in flood exposed areas than affluent neighbourhoods[13]. However, while such work is helpful, it is important to recognise that even at neighbourhood level communities remain heterogenous and are formed of diverse individuals with different incomes, social support, capacities, and occasionally competing priorities[1,2,14]. It is well-established in academic evidence that minority groups and those on low incomes are more likely to be socially vulnerable to flood exposure, as are women, people with disabilities and long-term health conditions, and older people (see Henderson *et al.* 2022 for a review). Indeed, in terms of flood adaptation, household income alone is one of the most significant predictors of adaptation (or lack thereof)[15].

The ability of individuals to participate within communities and their individual capacity to adapt is therefore highly variable for those tangible (income, education etc.) and intangible reasons (protection motivations; personal beliefs and attitudes; social support etc.)[5]. People value and trust information and support given to them by neighbours, friends and family more than institutions[1,16], yet they often externalise responsibility for managing flood exposure to external organisations, erroneously assuming those agencies will act to the protect them and their property[1].

This externalising of responsibility is one example of a maladaptive coping strategy adopted by individuals who do not have the necessary self-efficacy and/or the resources to cope with their flood exposure[1]. This lack of confidence, capabilities and/or resources can arise not only from psychological vulnerabilities e.g. non-protective motivation strategies (wishful thinking; denial etc.) but also from other 'hidden' tangible and intangible factors, e.g. stress; distress; mental and physical health impacts[17,18]. Therefore, as policy is implemented in practice across communities and individuals, it encounters a myriad of socioeconomic complexities and vulnerabilities that influence and determine flood resilience, and faces a lack of resources to address these inequities.

Community participation in flood resilience

These social vulnerabilities and inequities faced by some groups also influence how they participate in society[7,17]. To have successful participatory decision-making, policy makers must recognise and engage with a wide range of such vulnerabilities present across different groups, and this can be complex and challenging[17,19]. Unexpected challenges of participation can even come from the outcomes of that engagement, too, as communities may support social innovations and transformational approaches that question established systems, raising complex questions around power and preferences[19].

Egalitarian policies encourage such participation in place-based decision making, and indeed this is essential to equitable outcomes and inclusive engagement[20]. However, knowledge and power, and who holds them, can also undermine community flood resilience. Power and knowledge are not equally and equitably distributed between and within stakeholder organisations, community groups, and individuals[5]. For example, governments and institutional stakeholders have access to knowledge and expertise that local communities do not have[21]. Indeed, evidence suggests people expect public bodies to hold the expertise needed to resolve

Wider partnerships

Partners who already support place-based community flood resilience are drawn from a wide range of interest groups and organisational types. The following list is suggestive and intended to broaden engagement in place-based community flood resilience: regional development organisations and networks e.g. SHRED (Scottish Hub for Regional Economic Development); Community development organisations e.g. SCDC (Scottish Community Development Centre); Third sector development and advocacy groups e.g. Social Enterprise Scotland; SME support e.g. Scottish Chambers of Commerce; Health regulation and practice e.g. NMC (Nursing and Midwifery Council); Social care e.g. SSSC (Scottish Social Services Council); Education e.g. Education Scotland; Welfare e.g. The Poverty Alliance; Older people e.g. Age Scotland; and volunteers e.g. Volunteer Scotland.

their local issues[22]. However, the dominance of techno-scientific discourses and knowledge supplied by external expertise in place-based flood management initiatives can, where local knowledge is not sought and decisions are not co-created, exclude communities and even polarise community groups[2].

Alongside equitable participation, egalitarian policies also encourage collective sharing of responsibility across society. However, when tasks and responsibilities are devolved from national agencies to regional institutions, or from those organisations to private citizens, the power and resources required to deliver them are rarely transferred alongside that responsibility[23]. Furthermore, power has long been centralised in governing agencies and such historic power imbalances perpetuate, meaning state priorities may continue to take precedence over individuals' needs and wants[24].

Recognition of social values and viewpoints

In environmental justice, respecting people's different perspectives is fundamental to an equitable society, as it shapes peoples' understanding of flood exposure and drives individual adaptation motivation[7]. This understanding of sociocultural beliefs, norms and values is regarded as fundamental to community flood resilience[25]. As an egalitarian policy approach attempts to address flood exposure through collective action[26], social and political recognition of diverse values and the plurality of community concerns is essential[19].

Future Perspectives

Recent literature highlights a fragmented and inconsistent literature around resilience dominated by numerous theoretical frameworks[27]. In the absence of clarity, more research is needed to understand a) the dynamics of power and knowledge in building community flood resilience, including how to ensure equity in participation; b) the compounding effects of individual circumstances; and c) the investment needed to make multiply-vulnerable communities flood resilient.

Metrics should be developed to evidence the benefits to the most vulnerable in society of policy-driven actions[28]. Developing and implementing a sustainable monitoring programme in Scotland would a) enable transparent longitudinal monitoring of community flood resilience; b) evaluate the effectiveness of interventions, adaptations, participation and policy; and c) expedite improvements in policy and practice.

Conclusions

Recent Scottish policies reflect the emergence of a new egalitarian paradigm in Scottish flood policy. They focus upon building individual and community flood resilience through shared responsibilities, and prioritise communities as key stakeholders in place-based resilience. More widely, policies are increasingly embedding flood preparedness and adaptation within them, and evolving from a historical focus on prevention to instead target upstream adaption to flood exposure. Beneficial synergies between policies are emerging, including those policies that are not directly flooding-focused. Older state-focused planning and management policies have adopted this new inclusive place-based narrative on implementation, which now gives space to community groups to become more involved in community resilience planning and practice.

Whilst these innovative policy developments support future community flood resilience, the egalitarian assumption of equity necessary to sustain community flood resilience in Scotland has yet to be realised, as there remains inequities in the distribution of physical flood exposure and socioeconomic vulnerabilities. Recognition of the diversity of Scottish circumstances, viewpoints and vunerabilities is essential to build sustainable place-based community flood resilience and a Climate Ready Scotland.

References

1 Henderson, F., Helwig, K. & Teedon, P. 2022. Effective future communication of flood risk in Scotland. CRW2018_04. Scotland's Centre of Expertise for Waters (CREW). ISBN: 978-0-902701-97-7.

2 Scottish Government 2024. *What the Scottish Government does*. The Scottish Government. Accessed 4/3/24. Available at: https://www.gov.scot/about/what-the-government-does/

3 Henderson, F., Steiner, A., Farmer, J. & Whittam, G. 2020. Challenges of community engagement in a rural area: the impact of flood protection and policy. *Journal of Rural Studies*, 73, pp.225-233.

4 Ready Scotland 2022. The role of community groups in emergencies. Ready Scotland. Accessed 4/3/24. Available at: https://learn.ready.scot/group/5

5 Hudson, P., & Thaler, T. 2023. Defining affordability and adaptation resource prioritisation. *Climate Risk Management*, 42, 100569.

6 Rözer, V., & Surminski, S. 2021. Current and future flood risk of new build homes across different socio-economic neighbourhoods in England and Wales. *Environmental Research Letters*, 16(5), 054021.

7 Schlosberg, D. 2004. Reconceiving Environmental Justice: Global Movements And Political Theories. Environmental Politics, [online] 13 (3), pp.517–540.

8 Mehring, P., Geoghegan, H., Cloke, H. L., & Clark, J. M. 2021. Going home for tea and medals: How members of the flood risk management authorities in England construct flooding and flood risk management. *Journal of Flood Risk Management*, 15(1), e12768.

9 Ajtai, I., Ștefănie, H., Maloș, C., Botezan, C., Radovici, A., Bizău-Cârstea, M., & Baciu, C. 2023. Mapping social vulnerability to floods. A comprehensive framework using a vulnerability index approach and PCA analysis. *Ecological Indicators*, 154, 110838.

10 Aroca-Jiménez, E., Bodoque, J. M., & García, J. A. 2023. An Integrated Multidimensional Resilience Index for urban areas prone to flash floods: Development and validation. *Science of The Total Environment*, 164935.

11 Tate, E., Rahman, M.A., Emrich, C.T. and Sampson, C.C., 2021. Flood exposure and social vulnerability in the United States. *Natural Hazards*, 106(1), pp.435-457.

12 The City of Edinburgh Council 2023. Integrated Impact Assessment – Interim Summary Report. The City of Edinburgh Council. Accessed 4/3/24. Available at: https://www.edinburgh.gov.uk/downloads/file/34249/climate-ready-edinburgh-plan-2024-2030

13 Kazmierczak, A., Cavan, G., Connelly, A., & Lindley, S. 2015. *Mapping flood disadvantage in Scotland 2015*. Edinburgh, UK: Scottish Government. Accessed 4/3/24. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2015/12/mapping-flood-disadvantage-scotland-2015-main-report/documents/00490788-pdf/00490788-pdf/govscot%3Adocument/00490788.pdf

14 Andráško, I. 2021. Why people (do not) adopt the private precautionary and mitigation measures: A review of the issue from the perspective of recent flood risk research. *Water*, 13(2), 140.

15 Valois, P., Anctil, F., Cloutier, G., Tessier, M., & Herpin-Saunier, N. 2023. Following up on flood adaptation in Québec households four years later: A prospective exploratory study. *International Journal of Disaster Risk Reduction*, 103782.

16 Taylor, M., Miller, F., Johnston, K., Ryan, B., Lane, A., King, R., Narwal, H., Miller, M., Simon, H. and Dabas, D. 2023. Learning from the experiences of residents: January to July 2022 floods. *The Australian Journal of Emergency Management*, 38(3), pp.27-30.

17 Thomas, R and Niedzwiedz, C (2024) *Building Public Health Resilience to Fluvial Flooding in Scotland Policy Brief*. CSPF2023_01. Centre of Expertise for Waters (CREW)

18 Babcicky, P., Seebauer, S., & Thaler, T. 2021. Make it personal: Introducing intangible outcomes and psychological sources to flood vulnerability and policy. *International Journal of Disaster Risk Reduction*, 58, 102169.

19 Schlosberg, D., Collins, L.B. and Niemeyer, S. 2017. Adaptation policy and community discourse: risk, vulnerability, and just transformation. *Environmental Politics*, 26 (3), pp.413–437.

20 Peck, A.J., Adams, S.L., Armstrong, A., Bartlett, A.K., Bortman, M.L., Branco, A.B., Brown, M.L., Donohue, J.L., McCann, M.J. and Smith, E., 2022. A new framework for flood adaptation: introducing the Flood Adaptation Hierarchy. *Ecology and Society*, 27(4).

21 Roth, D., Köhne, M., Rasch, E. D., & Winnubst, M. 2021. After the facts: Producing, using and contesting knowledge in two spatial-environmental conflicts in the Netherlands. *Environment and Planning C: Politics and Space*, 39(3), 626-645

22 Rauter, M., Kaufmann, M., Thaler, T., & Fuchs, S. 2020. Flood risk management in Austria: Analysing the shift in responsibility-sharing between public and private actors from a public stakeholder's perspective. *Land Use Policy*, 99, 105017.

23 Rufat, S., Fekete, A., Armaş, I., Hartmann, T., Kuhlicke, C., Prior, T., Thaler, T. & Wisner, B. 2020. Swimming alone? Why linking flood risk perception and behavior requires more than "it's the individual, stupid". *Wiley Interdisciplinary Reviews: Water*, 7(5), e1462.

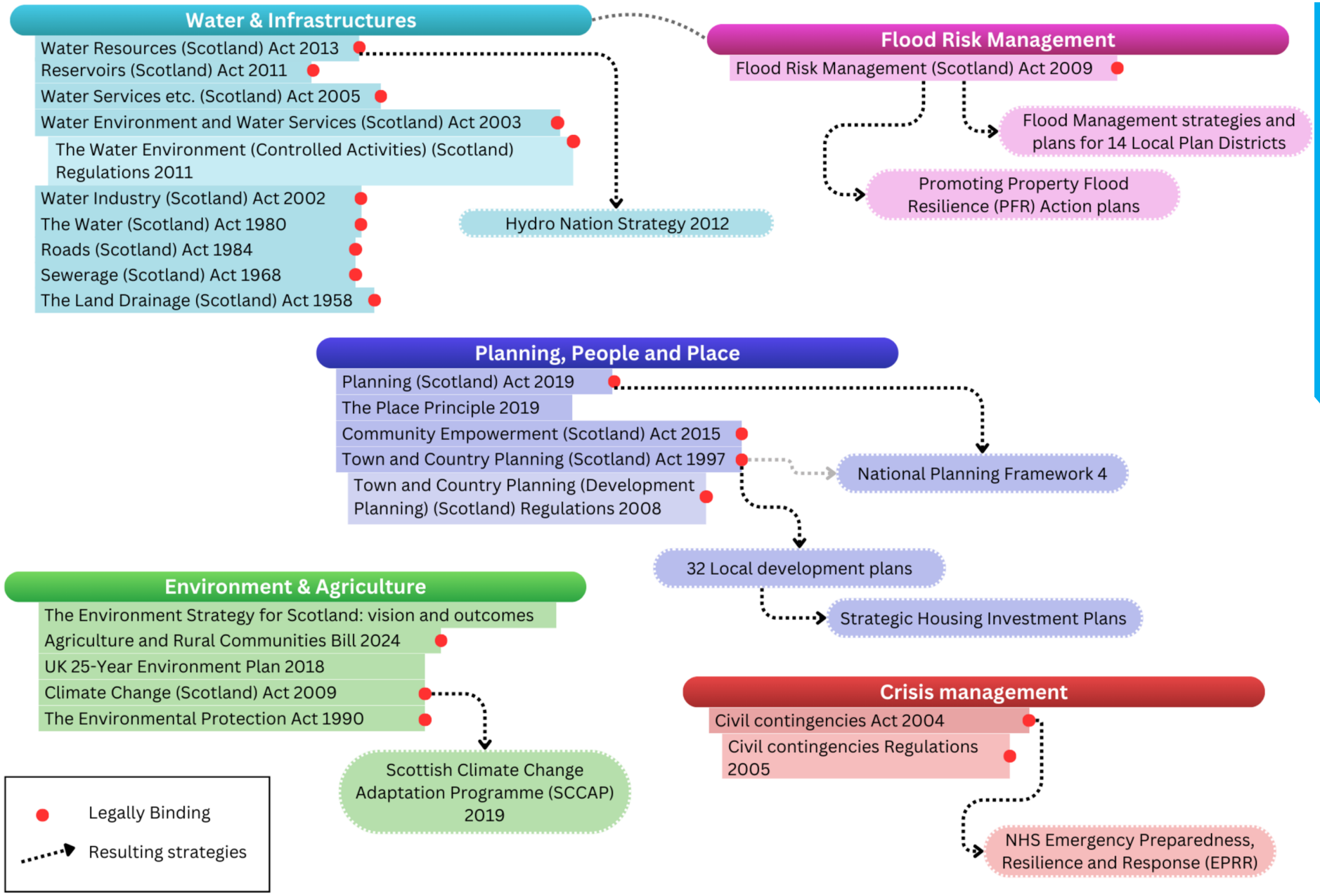
24 Hügel, S., & Davies, A. R. 2020. Public participation, engagement, and climate change adaptation: A review of the research literature. *Wiley Interdisciplinary Reviews: Climate Change*, 11(4), e645.

25 IPCC, 2022. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Accessed 4/3/24. Available at: https://www.ipcc.ch/report/ar6/wg2/

26 Ridolfi, E., Albrecht, F. and Di Baldassarre, G., 2020. Exploring the role of risk perception in influencing flood losses over time. *Hydrological Sciences Journal*, 65(1), pp.12-20.

27 Kuhlicke, C., de Brito, M.M., Bartkowski, B., Botzen, W., Doğulu, C., Han, S., Hudson, P., Karanci, A.N., Klassert, C.J., Otto, D. and Scolobig, A., 2023. Spinning in circles? A systematic review on the role of theory in social vulnerability, resilience and adaptation research. *Global Environmental Change*, 80, p.102672.

28 Carvalho, P., & Spataru, C. 2023. Gaps in the governance of floods, droughts, and heatwaves in the United Kingdom. *Frontiers in Earth Science*, 11, 1124166.


Water & Infrastructures
Water Resources (Scotland) Act 2013
Reservoirs (Scotland) Act 2011
Water Services etc. (Scotland) Act 2005
Water Environment and Water Services (Scotland) Act 2003
The Water Environment (Controlled Activities) (Scotland) Regulations 2011
Water Industry (Scotland) Act 2002
The Water (Scotland) Act 1980
Roads (Scotland) Act 1984
Sewerage (Scotland) Act 1968
The Land Drainage (Scotland) Act 1958
Hydro Nation Strategy 2012
Flood Risk Management
Flood Risk Management (Scotland) Act 2009
Flood Management strategies and plans for 14 Local Plan Districts
Promoting Property Flood Resilience (PFR) Action plans
Planning, People and Place
Planning (Scotland) Act 2019
The Place Principle 2019
Community Empowerment (Scotland) Act 2015
Town and Country Planning (Scotland) Act 1997
Town and Country Planning (Development Planning) (Scotland) Regulations 2008
National Planning Framework 4
32 Local development plans
Strategic Housing Investment Plans
Environment & Agriculture
The Environment Strategy for Scotland: vision and outcomes
Agriculture and Rural Communities Bill 2024
UK 25-Year Environment Plan 2018
Climate Change (Scotland) Act 2009
The Environmental Protection Act 1990
Scottish Climate Change Adaptation Programme (SCCAP) 2019
Crisis management
Civil contingencies Act 2004
Civil contingencies Regulations 2005
NHS Emergency Preparedness, Resilience and Response (EPRR)
Legally Binding
Resulting strategies

Visual minutes from project workshop.
Graphic Artist: Jenny Capon.

Contributors

Dr Fiona Henderson

Fiona is a Senior Research Fellow at Glasgow Caledonian University who has been researching community flood resilience for over a decade. As a research psychologist, her work focuses on policy, people and places, including community engagement; water management and governance; and social innovations in policy and practice.

Fiona.henderson@gcu.ac.uk

Rachel Dohain-Lesueur

Rachel is an EU project officer at Glasgow Caledonian University, where she coordinates large scale research projects and optimises participation in Horizon Europe. Her research interests include European R&I policies and UK/EU relations and science diplomacy, with a particular attention to the Scottish lens.

Rachel.Dohain@gcu.ac.uk

Bridget Bennett

Bridget is a Researcher at Glasgow Caledonian University with a background in environmental water management and the intersections of social science and sustainability sudies. She has specific research interests in water policy, community engagement, and water resuse strategies.

Bridget.bennett@gcu.ac.uk

Dr Karin Helwig

Karin is a Senior Lecturer in Water and Environmental Management at Glasgow Caledonian University. She is an interdisciplinary researcher with broad interests and experience in water-related topics, with specific focus on emerging contaminants, flooding and water justice. She leads the MSC Climate Justice and is a Post-Graduate Research Tutor.

Karin.helwig@gcu.ac.uk

Zarina San Jose

Zarina is an International and European project coordinator at Glasgow Caledonian University, where she oversees global cooperation for Research and Innovation projects. She has research interests across European and International research policies, with specific focus upon innovation, education and economic development.

Zarina.sanjose@gcu.ac.uk

CREW CENTRE OF EXPERTISE FOR WATERS

Published by CREW – Scotland's Centre of Expertise for Waters. CREW connects research and policy, delivering objective and robust research and expert opinion to support the development and implementation of water policy in Scotland. CREW is a partnership between the James Hutton Institute and all Scottish Higher Education Institutes. The Centre is funded by the Scottish Government.

This document was produced by:
Fiona Henderson, Rachel Dohain Lesueur, Bridget Bennett, Karin Helwig & Zarina San Jose
Glasgow Caledonian University, Cowcaddens Rd, Glasgow, G4 OBA, Scotland.

CREW Project Manager: Rebekah Burman

Please reference this policy brief as follows:
F. Henderson, R. Dohain Lesueur, B. Bennett, K. Helwig, Z. San Jose. (2024).
Policy to preparedness: Flood policy and community engagement. CSPF2023_03.
Centre of Expertise for Waters (CREW)

All project outputs available online at: crew.ac.uk/publication/policy-to-preparedness

ISBN: 978-1-911706-22-9

Dissemination status: Unrestricted

Acknowledgements: The authors would like to thank the participants of the CREW Science Policy Fellowships workshop held on 23 February 2024 at the Royal Botanic Gardens, Edinburgh, for sharing their knowledge, reflections and expertise with the research team. We would also like to thank Rebekah Burman for her support and guidance throughout the project, and extend our gratitude to both Rebekah and Nikki Dodd for organising and managing the workshop.

Cover photographs courtesy of:
Gordon Henderson: River Dee at Peterculter, 19 November 2022.

CREW CENTRE OF EXPERTISE FOR WATERS

Centre of Expertise for Waters

James Hutton Institute
Craigiebuckler
Aberdeen AB15 8QH
Scotland UK

www.crew.ac.uk

CREW publications can be accessed here:
www.crew.ac.uk/publications

@crew_waters CREW-scotland

CREW is a partnership between the James Hutton Institute
and all Scottish Higher Education Institutes and Research Institutes.
The Centre is funded by the Scottish Government.

Scottish Government
Riaghaltas na h-Alba
gov.scot