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Scaling up social learning and innovation to support community flood resilience with Project Groundwater, UK

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ABSTRACT:
'Resilience' has become a guiding principle in the flood risk sector. With the acceptance that not all flooding can be prevented, risk management authorities (RMAs) need to build long-term, trusting relationships with communities at risk to support local level responses. Yet traditional top-down norms remain problematic; there is an urgent need for *social innovation* and learning in the sector. The paper details participatory action research with a UK Government-funded partnership collectively building community resilience to groundwater flooding in southern England. The research has surfaced the largely tacit, intangible, and hence hitherto unacknowledged engagement skills and practices. Furthermore, the research found that the status quo has been challenged, with novel multi-disciplinary processes transforming norms towards a collaborative relationship with communities. The paper finally considers the current project-by-project nature of engagement, which risks communities feeling abandoned when the funding ends. In addition to the resource implications for maintaining participatory competencies for capacity and relationship building with communities, the biggest challenge is seen to be that of wider culture change; to consider how the scaling up of social innovation beyond the project helps underpin lasting change in the sector.

Keywords: community resilience, community engagement, social innovation, innovation scaling, flood risk, groundwater flooding

1. Introduction

A recent shift from 'reducing flood risk' to 'increasing flood resilience' sets a new strategic policy direction in England. The Environment Agency (EA) is the public body responsible for taking a strategic overview of the management of flooding. Their most recent national level strategy frames resilience in terms of "the capacity of people and places to plan for, better protect, respond to, and recover from flooding" (EA, 2020, p 25). The strategy still commits to building and maintaining flood defences, but also to make places "more resilient" so that when flooding does happen, this causes less harm and enables faster recovery for local communities (EA, 2020). Framed through the notion of resilience, a core ambition of the EA's strategy (2020) is for local people to understand their risk to flooding, to know their responsibilities and how to take action.

The EA's policy shift to work more closely with communities corresponds with a longer-term, broader shift towards more participatory forms of governance occurring at an international level. Harnessing the knowledge, skills and experience of communities improves governmental capacity to collectively solve complex problems and to have better

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informed decision making (Anggraeni et al., 2019; Forde, 2020; Head, 2007). Communities with direct experience of the problems often have more viable means to tackle them (Forde, 2020). For communities, there is the anticipation of a greater say and influence in the issues that concern them and hope for an improved outcome (Anggraeni et al., 2019; Head, 2007). In flood risk management this has been captured by scholars as the 'social turn' (Hügel & Davies, 2020), signalling a broader trend to a civic model of flood risk citizenship whereby, in theory, experts do not set out the issues, but the issues are negotiated amongst participants, redistributing expertise (Hügel & Davies, 2020). In the shift from traditional, top-down risk management to flood resilience, strategies and intervention options should be developed from the outset through the meaningful involvement of communities, which means relationship building is required, integrating local knowledge with technical expertise to facilitate a response to what is a societal, as well as a technical challenge (Thaler et al., 2019; Twigger-Ross et al., 2020 as cited in Potter & Fitton, 2026).

Despite the high expectations surrounding participatory governance, community participation in practice largely remains a rhetorical commitment (Hügel & Davies, 2020; Sarkki et al., 2019). It is claimed that the flood risk sector has failed to date to adopt 'meaningful' community engagement processes (Cook et al., 2025 as cited in Potter & Fitton, 2026). Top-down decision-making processes still dominate, and any engagement initiatives are often aimed at educating communities, their lack of awareness seen to be the main problem (Stewart, 2024). Any ambitions for participation frequently fall short of the power-sharing that was originally envisioned, to the extent that the flood risk management sector's failure to change is seen as "a critically important societal challenge" (Cook et al., 2025, p. 2 as cited in Potter & Fitton, 2026). More attention has been given to changes on the part of the public and their capacity to deal with flood adversities. Whereas change and reconfigured relationships between authorities and communities are required for a genuine shift to participatory governance (Sarkki et al., 2019), so it follows that public participation crucially requires capacity building for the actors in the resilience building decision-making processes (Hügel & Davies, 2020). There have been recent calls within this sector for research into the potential role of social innovation to enable this change from the top down to the bottom-up community-focused values and approach of participation (Cook et al., 2025; Thaler et al., 2025 as cited in Potter and Fitton, 2026).

Social innovation (SI) is increasingly being recognised in providing novel solutions to cope with expanding or new social, economic, political and environmental challenges (Edwards-Schachter et al., 2012; Howaldt et al., 2021 as cited in Potter & Fitton, 2026). Social innovation is seen as a means to respond to these challenges; working collaboratively, empowering communities, advancing public sector reforms towards an improved quality of life (Edwards-Schachter et al., 2012). Social innovation can be something more tangible, such as a product, but a number of authors focus on 'process orientated' social innovation, which centres on the need for novel collaboration, through new or improving existing social relationships and collective actions, changing basic routines as to how goals are accomplished (Cajaiba-Santana, 2014; Grimm et al., 2013; Nordberg et al., 2020). Most participatory initiatives operate and take effect at the local level, as this is the governance level closest to communities' lives (Forde, 2020). However, whilst local governments are important social innovation intermediaries, scaling up

promising local-level innovation initiatives, both within and across contexts, is known to be a challenging task (Bresciani & Tjahja, 2025; Currie et al., 2025). Leaders of local social innovation initiatives are known to struggle to have an impact on wider systems (Moore et al., 2015). Hence scholars are seeking insight not only into local-level social innovation, but how innovations are then sustained beyond the pilot stage, including the need for empirically investigating the strategies of social innovators in order to attempt to create systemic change and to understand how this varies across different contexts (Currie et al., 2025; Moore et al., 2015).

This paper examines social innovation within a groundwater flood risk management pilot project in England, local authority led, part of a larger innovation programme managed by the Environment Agency (Environment Agency, 2026). Studies of technical innovation are themselves limited, studies of social innovation in flood risk management are few and far between. This case is interesting, although communities were genuinely 'the whole point' and central to the project, any social innovation was initially unplanned and essentially hidden to the participants, the focus for innovation was instead centred on the more tangible, technical outputs. In the next section, through further defining social innovation across the dimensions of culture, processes and structure, the challenges faced by local level practitioners in undertaking meaningful community participation is set out in greater detail across these same dimensions. The paper also draws on the fields of social innovation and strategic niche management to set out the challenges of a pilot level project in scaling innovation to bring about the necessary wider system level learning and change. Following a description of the methods of the study with Project Groundwater in section three, the study's findings are presented, then discussed using the analytical framework to further our understanding on the potential role of social innovation in building community resilience through community engagement, before finally drawing to conclusions and recommendations.

2. Drawing on Social Innovation to Address the Challenges in Building Community Flood Resilience

Challenges and negative perceptions of participation are widely documented in the literature, with a lack of trust, respect and confidence in the system, against a history of poor relations between communities and local government (Geekiyange et al., 2020). For community flood resilience, there need to be stronger, trusting relationships between community organisations and those responsible to execute flood resilience functions, to be initiated and sustained over the long term (Geekiyange et al., 2020). A core focus of social innovation is to encourage more democratic, 'bottom-up' processes through participation in decision making and the empowerment of vulnerable groups (Edwards-Schachter et al., 2012; Moulaert et al., 2005; Rehfeld et al., 2015; Thaler et al., 2025 as cited in Potter & Fitton, 2026). As well as involving the need for a change in processes, social innovation also draws attention to change in structures and more fundamentally, culture, in order to meet societal goals (Park et al., 2021).

2.1 Identifying the need for social innovation in adopting meaningful participatory practices

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2.1.1 Culture

In the flood risk management sector, the top-down ethos still dominates, against the need for a participatory approach and building relationships with communities (Potter & Fitton, 2026). Commitment for community engagement can be low, engagement can often be seen as a matter of managing expectations rather than a genuine commitment to listen to communities and understand what is being said (Geekiyange et al., 2020). The extent to which citizen participation is valued can depend on whether private beliefs and motivations align with the principals of participatory governance, hence the dominant organisational culture can enable or constrain participation (Wittels, 2023).

Recent innovation studies confirm the importance of the receptiveness of context, encompassing organisational culture (Currie et al., 2025). There can be the need for extensive 'groundwork' by senior team leadership, in order to overcome potential resistance to innovation and develop a receptive culture, which is important at the pilot or 'niche' stage of the innovation but is key in sustaining the innovation (Currie et al., 2025). Learning processes to promote the innovation, to build shared mind-sets, thus, to scale ideas deep into the routines, practices and beliefs of partners and collaborators are said to be important (Moore et al., 2015). This can involve deliberate transfer of practices, capturing and sharing the innovation niche's culture, through shared reflection and evaluation practices, termed 'scaling deep' (Moore et al., 2015).

2.1.2 Processes

There has been a tendency to view participatory governance as a remedy for complex challenges, but it is stressed that merely establishing some sort of participatory or engagement mechanisms is not enough to ensure their potential (Forde, 2020; Head, 2007). Instead, there needs to be a clearer and stronger focus on participation strategies in local policy and processes, clearly setting out how they are of relevance and benefit, with a clearer sense of purpose for communities to engage. Community resilience in particular is very much shaped by inherent diversities, that lead to power imbalances and inequality of access to resources (Abeling et al., 2018), yet there is also a current lack of understanding in practice that communities are diverse, and not homogenous (Fitton & Wilson, 2026; Potter & Fitton, 2026). Hence capacity building is seen to be crucial for successful participatory processes, because different individuals and community groups have varying starting positions due to their existing knowledge and experience of the issue at hand (Head, 2007). Hence it is considered important to assess a community through the use of different capacities, for a much more nuanced understanding, to profile where *long-term* support is required, with greater input and support for the most vulnerable (Geekiyange et al., 2020).

From the process-orientated perspective, social innovation facilitates this focus on 'how' social goals are accomplished. Social innovation demands that needs are addressed better than is possible through conventional, established practices (Conrad, 2015; Howaldt & Schwarz, 2010 as cited in Grimm et al., 2013). Authors stress how social innovation is seen as the *purposeful* or intentional reconfiguration of social practices, that rests on social relations and collective actions to prompt social change (Cajaiba-Santana, 2014; Slee, 2019). This places greater emphasis on new or improved social relationships and forms of collaboration (Cajaiba-Santana, 2014; Kelly & Kelly, 2025), including

between organisations, and between citizens and institutional actors (Conrad, 2015; Slee, 2019; Thaler et al., 2025) in order to meet the diversity of needs in local communities (Moulaert et al., 2005; Nordberg et al., 2020).

2.1.3 Structures

Stakeholder engagement processes are known to be less effective due to weak administrative structures in local government that do not adequately support community participation (Geekiyanage et al., 2020). Participation can only be effective with receptive, responsive and compatible institutional arrangements (Forde, 2020). This often means dealing with issues of institutional change, focusing on how participatory spaces are generated, on places and levels of engagement and power dynamics, otherwise weak structures will continue to curtail participation (Forde, 2020). Fundamentally, there is a lack of adequate investment and resources for community participation, including a lack of knowledgeable and experienced professionals, and a shortage of dedicated staff with competency in engagement tools and techniques (Forde, 2020; Geekiyange et al., 2020). Participatory initiatives of a top-down nature only gift 'advisory' powers, rather than genuine empowerment (Forde, 2020). Instead, there is a need to strengthen accountability and inclusiveness, with powers devolved to local-level communities and their representatives (Geekiyange et al., 2020). There has been a long-documented lack of clarity concerning the evaluation of the effectiveness of participatory processes, which hinders participatory practices (Geekiyange et al., 2020; Head, 2007). In part this is seen to be due to the often-vague objectives of community engagement from the offset (Head, 2007). Indicators need to focus on both delivery outcomes *and* the quality of participatory processes, including evaluating levels of public satisfaction and empowerment, so the value of participation can be demonstrated (Geekiyange et al., 2020; Head, 2007).

As well as changing basic routines (as processes), social innovation also directs attention to the reconfiguration of formal institutions (Slee, 2019), including profoundly changing resource and authority flows (Westley & Antadze, 2010). Innovation outcomes need to be carefully integrated into existing strategies, organisational routines and professional practices, including building organisational capacity (Currie et al., 2025). If pilot innovation projects do not consider this 'scaling out' of innovation, then innovation can otherwise struggle to embed beyond the initial stages. The organisation needs to have the capacity to articulate expectations and a vision for the innovation and build social networks to create support and facilitate learning processes for embedding innovation beyond the pilot stage to impact greater numbers of people or communities, including dissemination through communication channels (Bresciani and Tjahja, 2025; Moore et al., 2015). Resource constraints together with adversity can mean the potential failure and ending of the innovation journey (Currie et al., 2025). This 'scaling out' of innovation is a critical step, however scaling social innovations to effect larger-scale change is seen to involve a much more complex and diverse process (Moore et al., 2015). Westley et al. (2014) differentiated between 'scaling out' to also include 'scaling up'. Scaling up encompasses efforts an organisation makes to affect *all* in need of the particular social innovation, which means addressing the institutional or systemic roots of the problem, including change in national level policy and availability of resources, often requiring new funding, or entirely new funding models, not only for scaling process, but also to build

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internal capacity (Moore et al., 2015; Westley et al., 2014). Outcome measurement or evaluation is also seen as important in sustaining innovation.

2.1.4 In summary

Social innovation provides a response to the challenges of changing from a top-down ethos to a participatory approach, working with communities. Culture change is seen as a fundamental requirement for innovation, in order to address obvious tensions between what are abstract or rhetorical theories to the effective operationalization of public participation initiatives with communities (Hügel & Davies, 2020). Novel processes and practices are necessary to build trusting relationships, in order to enable a greater understanding of the diversity of and within communities, with a variety of viewpoints and experiences, to build resilience capacity. Administrative structures need to change in order to undertake long-term participation, with ongoing resources and commitment, driven by clear objectives and evaluation methods. Pilot stage innovations thus need to consider a combination of 'scaling' strategies across these dimensions, and it is seen to be a combination of scaling 'out', 'up' and 'deep' that is most likely to support greater and more durable system-wide change.

3. Methodology

3.1 Project Groundwater (Buckinghamshire)

In 2021 a £150 million, six-year Flood and Coastal Resilience Innovation Programme (FCRIP) commenced, managed by the Environment Agency and funded by the Department for Environment, Food and Rural Affairs (Defra, a ministerial department of the English government). Project Groundwater, led by Buckinghamshire Council in the Southeast of England, is one of over 25 projects funded by the national innovation programme. Any detailed knowledge and understanding of groundwater flood risk before the project was limited, with incomplete mapping and modelling data causing a challenge for communities to prepare for and respond to flooding events. Project Groundwater focuses on this under researched and poorly understood flood source, primarily developing the modelling data required to better prepare for and predict these events, to put in place a widely available flood warning system and develop flood management plans (Project Groundwater, 2024). The project focuses on nine different pilot communities within the project area, to improve understanding, raise awareness and increase resilience through the development of innovative solutions in collaboration with those impacted by groundwater flooding (Project Groundwater, 2024). There are several main areas of focus and linked workstreams, being 'governance', 'engagement and communications', and a series of 'technical' workstreams (e.g. monitoring, modelling, alerts, resilience and placemaking). A 'legacy' workstream was initiated in the final year of the project.

3.2 Participatory research approach: The Research Practice Partnership

The authors have been involved in what can be termed the 'niche' level innovation, as active participants in the project's collaborative structure from the partnership's conception. They lead the 'Research Practice Partnership' for Project Groundwater, which was established in collaboration with the workstream partners to

examine and attempt to bridge a perceived gap between the concepts of community participation and current practice. The lead author (KP) is herself a former local authority officer, now an academic and affiliated to a University. The second author (SF) is a consultant in community engagement, contracted as the strategic lead of the Engagement Workstream. She has a PhD, is experienced in the qualitative research approach and remains an active researcher in the field.

Following Participatory Action Research principles, an iterative approach was taken to the research and learning, whereby the partners/stakeholders were actively involved to tackle the social problem, through the PAR principles of flexibility, collaboration, theory testing, cycling between action and reflection towards learning (Sarkki et al., 2016; Tetui et al., 2018). Participatory Action Research emphasises collaborative participation to produce knowledge directly relevant to the stakeholder community, that is not intended to build social science theory, but instead to contribute to an agenda of social and policy change (Coghlan & Brydon-Miller, 2014). As such, the authors were included as a dedicated academic workstream in the project's governance arrangements. As with qualitative research in general, it is believed that richer and more legitimate data can be obtained when working more closely with team members, gaining a deeper understanding of their experiences and therefore the research has the potential to be more beneficial in informing practice and policy (Langley & Klag 2019 as cited in Potter and Fitton, 2026).

Project Groundwater offers the opportunity to evaluate change in participatory governance and processes, in a sector characterised by strong path dependency to a top-down approach. To note, although collaboration with communities is at the heart of the project, social innovation was not an explicit objective from the outset (Potter & Fitton, 2026). One of the key drivers from participants for the social innovation research was the response to the 'push for numbers' in the project's reporting process, and what was seen as an apparent lack of appreciation of the complexities and challenges of the engagement process, notably the importance of the relational elements of the project.

3.3 Methods

The authors were involved in (or led) project meetings, which contextualised the research and facilitated the PAR approach. The first stage of the research sought to raise awareness and 'surface' the social innovation (see Potter & Fitton, 2026). Primary data was gathered through semi-structured interviews, undertaken with 17 project team members, to gain rich insights into the social reality of building community resilience and social innovation from the participants' perspectives. Participants were purposefully chosen from across the project's workstreams, on the basis that: they possessed direct experience of engaging with the project's pilot communities; and that they represented a diverse range of roles and perspectives concerning building community flood resilience. The participants can be divided into three categories (and in brackets, identifiers for the quotations in the ensuing findings section) of: 1) communication and community engagement specialists (C&E 1-8); 2) technically orientated e.g. working on property flood resilience, town planning, nature-based solutions, flood warning and monitoring (T 1-5), or 3) governance (G 1-4). The interviews were conducted online through Microsoft Teams between November 2024 and January 2025 and lasted an average of 45 minutes. All those

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approached agreed to be interviewed. The participants and the authors were all familiar with each other, having been working with each other on the project. The researchers do not claim that the participants are necessarily representative of the wider population.

QSR International's NVivo (15) software was used to deductively code and analyse the interview transcripts. The authors worked independently with a set of a priori codes based on the conceptual framework, whilst also being open to unexpected themes (Auerbach, 2003; Bingham, 2023). A coding guide enabled greater consistency, which supported the trustworthiness and rigor of the research (considered particularly important with 2 researchers) (Bingham, 2023). Quotes from the participants have been embedded in the findings, to do justice to the richness of the insight from the participants, and to aid in the understanding of the authors' interpretation of the interview data (following Bazeley, 2007; Nowell et al., 2017).

Given the participatory nature of the research, the authors and research participants have closely worked together to design the research, examine the findings and proposed actions. Written and verbal consent was obtained from each interviewee, ethical considerations of anonymity, privacy and confidentiality have been upheld. As well as sharing the manuscript before submission for comment, the findings have been presented, discussed and reflected upon with participants and wider project stakeholders across several project meetings, workshops and project annual summits. This affirmed and validated the findings ensuring an accurate representation of participants' perspectives and experiences. It also allowed a joint policy response to influence the Environment Agency (as the project funder). The authors continue to work closely through the legacy workstream, using the techniques of participatory observation (project meetings and workshops), documentary analysis (policy and project documents), seeking to further understand with project partners on how to scale the project's learning from social innovation for longer term legacy and broader impact beyond the single 'niche' project arrangement.

Ethical approval was granted by the Open University Human Research Ethics Committee (HREC reference number: 2024-0741-2).

4. Results

4.1 Culture

The project did commence with a top-down orientated approach, in which technical partners had a tendency to see the communities' lack of knowledge of groundwater flooding as the problem, which should be solved by 'education'. Engagement was seen as "*critical*" to "*convey messages that we need to get across*", to "*clearly get across the information and knowledge we've gained through the project, whether that's the modelling results, the monitoring, obviously the flood warning service*" to make sure "*people can clearly understand*" (T3). Pressure was also evident, being in receipt of innovation funding, to demonstrate: "*changing perceptions, changing beliefs*" in communities (G1), rather than authorities. The majority of participants were focussed on the need to deliver tangible outputs, seen to be existing technical concepts, methods and products being applied in the different context of groundwater flooding, such as to "*develop new tools*" (G1), a flood warning system, or a set of new flood modelling maps or a series of Nature Based Solutions (NBS) Schemes (T4/G2). There were perceptions that the project needed technology, such as drones, in

order to "*get full marks*" (G3) from the project funder. The potential for social innovation had not initially been considered for the project: "*I don't believe we've set any priorities ourselves to be innovative in how we communicate*" (G1). The main purpose of the project's engagement specialists was seen to be promoting the technical innovation, initially acting as disseminators for the technical workstreams, as 'go-betweens' to seek feedback from the community on how the new technical tools being developed, including groundwater flood models and alert systems, were working for them: "*really what we're trying to do is deliver all the innovative ideas from other work streams*" (C&E7) or "*trying to get feedback from community residents on how this new innovative tool works for them and then feed that back well*" (C&E7). In "*comms, I wouldn't say we really have innovation as a priority in the way that we work, but more in that we want to promote the fact that innovation is being used throughout the project*" (C&E6).

However, communities were genuinely central to everything that the project sought to achieve, to empower communities to be better prepared for flooding: "*they're at the heart of what we're doing right*?" (G4). Community input was seen as essential to enhance the designs, and the technical workstreams were open to integrate community ideas: "*you know, hearing what communities have to say and having that real two way, not just us saying here's what we've done for you and, you know, making them in receive mode*" (G4) and "*I think communication has been really critical to define what we're looking to achieve as a as a workstream*" (T3). It was acknowledged that the project should be demonstrating and capturing social innovation, a need was seen to change: "*that kind of perception of what innovation has to be*" (C&E4), that innovation could mean that we "*actually went in and really got to understand, build relationships with people*" (G3). There was a strong participatory ethos acknowledged across the project, communities at the heart with a level of investment into engagement not typically seen in the sector: "*I've seen a stark contrast in how we act, and a lot of the other programmes on the FCRIP, to the projects I've met outside of the fund*" (G4). The Research Practice Partnership has challenged assumptions on social innovation and opened this up to reflection and learning within the project partnership: "*making yourself more vulnerable is something I will take forward and the value of engaging people early*" (T1) and "*we, you know, we are technical people, but we do recognise that we want, we need, to be better and we're, you know, trying to put mechanisms in place to do that*" (G1).

4.2 Processes

The project's technical partners were initially unaware of the levels of complexity of the engagement process, and the importance of understanding communities' capacities. The engagement specialists immediately recognised that the nine pilot communities were all very different, that they were at various stages of a journey to flood resilience, from those with little awareness and needing knowledge of simple actions, to those already building resilience and adapting:

You can't just come up with a process and assume it's going to work, because humans are different, and they've got different beliefs, different values…but also different circumstances and environments that they're living in….and from experience, I know that takes a lot more effort than just applying a standard approach to people (G4).

Stakeholder engagement plans were tailored and continually reviewed to reflect the different needs of each of the communities. Instead of seeing communities with little to no awareness risk as an 'education' need, the communication and engagement

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workstream sought to be stronger and more imaginative communicators, in order to translate dry and complex flood risk information through new and diverse channels to help communities understand and look to motivate changes in behaviours. For example, an animation was commissioned to form a personal and emotional connection with the otherwise complex and remote form of Groundwater flooding; "*it's very difficult to get people emotively engaged….nobody even thinks about flooding unless they have been flooded*" (C&E6). The animation sought to use a "*lovely story…you are pulling on an emotional heart string. You are making them like fall in love with a very beautiful character. And then you're watching their struggle*" (C&E6). For those with a greater understanding, the combination of technical and local knowledge and experience was found to be vitally important, which was facilitated through the engagement specialists. The need for facilitation between technical workstreams and local knowledge and experience in the community brought about new processes in the project. Initially it was challenging for the engagement team to: "*be able to go into conversations with communities*" as it was "*hard for them to do that unless they've got that clarity around what those, what those other work streams are actually delivering*" (C&E4). The engagement team felt somewhat isolated, "*we'd sit having discussions and we were 'we don't know what's happening', or we felt a bit out there in the middle of no man's land*" (C&E1). Over the first two years the team increasingly insisted to "*be in more of the partnership calls because we need to understand these partners better and what it is they're doing and how we can then use that in our engagement work*" (C&E4). Closer working relationships then enabled the engagement workstream to better facilitate working relationships between the project and the communities:

We would know them [the community] better…I think now that we are involved and we do know the communities, we can actually talk with relevance about what we're experiencing….. being able to attend some of these meetings that we didn't do initially has really made a big difference (C&E1).

The communications and community engagement team now make it very clear to get the community and others in at a very early stage, "*it's something that they have been very good in pushing that culture across*" (T1). From the technical perspective, the joint working processes were appreciated:

And the vulnerability that goes with actually just going [to the engagement team] and 'say look, these are the issues. What do you think?', which is not comfortable to most professionals…And I think that the innovation process of doing that. And it, you know, the roof has not fallen down. We've actually done it and in most cases it brings in things that you never thought were there and if nothing else, the confidence of the community you're engaging with and that's, you know, ownership and that feeling that they're not being talked to, but talked with you know, that really is what that then brings (T1).

4.3 Structures

Although not recognised as a potential source of social innovation, there was however immediate recognition from the project's governance team that engagement is: "*a specialist skill that most of the practitioners and the professionals don't have…..in any project I've worked in where the project has fallen down, it's because we haven't thought about communication*" (GP1). Project Groundwater contracted a senior consultant in stakeholder engagement and communications. They employed an inhouse communications and engagement officer, situated within the project team to enable access to the 'day-to-day' workings of the project. An early decision was also taken to create a dedicated role for strategic community engagement (the author, SF), and an engagement delivery partner was brought onto the

project in the second year. It was acknowledged "*that there is a really good investment and effort around community engagement, probably not typical across the piece*" (C&E4).

The project commenced without any set priorities for social innovation, hence was initiated without meaningful outcome measures being identified. Instead, the project was delivering on high level, economically driven outcomes demanded by the project funder:

But actually is there a 'tangible' outcome for delivering things in the way that we've done it, we've probably not nailed it yet, how do you evaluate that….if we looked back when we started Project Groundwater and where we are; the mindset change, the openness, the discussions that are happening. If we would have properly evaluated that, would we have seen a difference? I think we would have (G4).

There was very little research before the Research Practice Partnership endeavoured to deepen understanding and capture the social innovation on engagement in the project, before that it was seen to be: "*anecdotal observations I guess, but it would be interesting to have evaluated that kind of change, wouldn't it?*" and "*I know there's lots of learning that we're not surfacing*" (G4). From the innovation programme level, the EA have asked projects to capture project level lessons, but also to think about what can be scaled, whether change has been embedded and if so how. However, the EA are seeking to determine the economic benefits of the projects' resilience actions, to justify investment and increase uptake. The EA see the need for the project to quantify benefits, including engagement effectiveness 'scores' and to capture time saved. Where it is conceded that a quantification is not possible, then a qualitative 'description' is considered 'sufficient'. The engagement and communications workstream's concern is that a simple quantification of engagement events or a headcount of people that the project has engaged with does not adequately capture the relationships and level of trust developed with communities over the duration of the project:

None of those outcome measures and things relate to anything like that [engagement]. So when the government is …starting to chop budgets, training and some of the other things that we need to do are the first to go and it is not measured in any way so, we don't have to. All the post evaluations that have been done a lot…they do them a lot less now…I don't think even when it happens that it tends to come out more often than not that when things go wrong, some of the big reasons why they go wrong is communication (T1).

From the project and programme level, the surfacing of the social innovation has been welcomed and appreciated by community engagement orientated individuals, with strong encouragement to disseminate the findings. However, as innovation cannot be learned and applied 'off the shelf' following a paper, presentation or webinar, it needs to be carefully integrated into existing strategies, organisational routines and professional practices. The issue is that the project funding and the investment in community engagement is imminently coming to an end (March 2027), with significant implications for the scaling of innovation. Operating within a safe niche with contracted engagement expertise, the social innovation has been largely detached from local-level mainstream services, in particular, frontline professionals in the lead local flood authorities have not been involved in the project's engagement activities. As the expertise has been brought in, there is also a lack of understanding as to how and whether the innovation can be adapted into mainstream services. The project's website has been given attention, as a repository of information for communities, although it is currently proving difficult to

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secure the necessary resources to host. There have also been discussions to establish community forums, to further empower communities. Early indications are that there are insufficient resources to sustain such plans:

So I think that changing the flow of resources and that authority, I don't think we have changed that and I don't think we're even thinking of that in the project….because what support is there going to be there for the communities, there isn't at the moment, there's nothing for them and that's a really difficult message….You can create a plan and that will be part of the support, but without the resources and the back up - who do they call, who's going to come out? (G1).

The legacy workstream is dedicated to ensuring that the investment made through Project Groundwater sustains momentum in changing the landscape of groundwater flood management forever (Project Groundwater, n.d.), which now includes a consideration of scaling social innovation: "*we're still dealing with each community in isolation, and I think our thinking needs to develop if we're going to change the system because we need to show how the system could be changed*" (G1). There are current activities through the legacy workstream, driven by the Research Practice Partnership, to explore and discuss the capacity of lead local flood authorities to carry the longer-term collaborative activities, that ultimately should involve sharing power and decision making with communities. This includes continued support for the network of flood groups, in which the project's engagement officers are currently embedded. Yet there is an observed tension in the project partnership and wider stakeholders, between seeing the need for a longer-term commitment to and with communities for building resilience versus achieving and thereby completing the project's objectives for community engagement by leaving communities more resilient than when the project commenced through technical innovations. The latter meaning that legacy outcomes are mainly only sought through ongoing supportive structures around the flood modelling and alert systems.

5. Discussion

The study has responded to calls within the sector into the potential role of social innovation to enable change from the top down to the bottom-up community-focused values and approach of participation and in particular to understand the conditions under which it can thrive (Cook et al., 2025; Thaler et al., 2025). The aim was never to map out all engagement challenge or social innovation outcomes, but to provide a convincing account to recognise the importance of social innovation and to place this on an equal footing with technical innovation. This understanding has been advanced through exploring the linkages with documented challenges to community engagement across the core dimensions of culture, processes and structures. The first stage for social innovation is said to be identifying a problem and therefore need to innovate (Cinar et al., 2019) hence, it could be said that the research practice partnership has been on the back foot seeking to evaluate social innovation that was not purposively designed. Nevertheless, it is argued that social innovation has occurred. The research has shed light on 'how' Project Groundwater has built trusting relationships, new forms of collaboration and changed how public administrations can potentially engage with communities in building local-level resilience to flood risk through changing mindsets and introducing new collaborative processes. The vulnerabilities and various resilience capacities and processes that impact

a community's ability to react and adapt to an event are complex, but they are also context-specific. The partnership's groundwater flooding stressor is arguably the least understood within flood resilience policy. Project Groundwater has recognised and further understood the nature of this stressor and the characteristics of the affected communities, building relationships to facilitate community-based resilience actions.

The local level thus presents both an opportunity and a critical challenge for communities and local government organisations to innovate through, and *with*, participatory approaches towards an alternative future. Expanding the impact or scaling up promising local-level innovation initiatives is also known to be a challenging task (Bresciani & Tjahja, 2025; Currie et al., 2025). Local governments are recognised as key intermediaries, in initiating projects, building networks, providing the resources, managing and evaluating funding initiatives (Bresciani & Tjahja, 2025). Yet, just as importantly, they should connect innovation initiatives through and up to other relevant stakeholders, namely policymakers (Bresciani & Tjahja, 2025). Current engagement processes in flood risk management typically run on a project-by-project basis. The six-year funded innovation project has provided more time than is considered typical for communities and stakeholders to build trusting relationships with a Local Authority, to collaborate and achieve significant results on the ground. Yet six years is a short spell in the context of climate change, and the end of the project risks wiping out the efforts taken in participatory processes and the consequent informed engagement of communities. The study has provided an insight into the difficulties faced and in order to meet the project's aim of *transforming* how communities prepare and respond to groundwater flooding, Project Groundwater still needs to seek a deeper understanding of how the niche level social innovation can become more widely adopted – scaling out, up and deep.

5.1 Observed interactions between the dimensions and levels of culture, processes and structures

The findings as analysed through the dimensions of culture, processes and structures cannot be seen as isolated, the reality is more complex as they interact with and reinforce each other across administrative levels of local and national government.

Social innovation is known to fundamentally entail, or require, changing the culture – that is the attitudes, beliefs or values in and across a social system (Kelly & Kelly, 2025; Westley & Antadze, 2010). Personal beliefs, values, motivations and professionalised norms remain significant drivers of whether or not a participatory initiative receives the attention required (Wittels, 2023). Van Buuren et al. (2015) have previously exposed how the dominant values in water governance act as a barrier to the implementation of a proposed innovation. This study goes further to demonstrate that the dominant 'top down' values frame what innovation actually entails, that is only technically focused, but the project's participants have altered the values guiding how practitioners engage with communities and therefore that innovation has social dimensions. However, the study has revealed that there is a need for further understanding as to whether there is a receptive culture to the social innovation processes in community participation beyond the niche level, otherwise the dominant top-down culture will continue to constrain participation.

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There is a known tendency for project managers and policy makers to refer to stakeholder participation without then providing or having enough financial support to realise any meaningful engagement (Anggraeni et al., 2019). In their systematic review of barriers to the public sector innovation process, Cinar et al. (2019) found that the primary barrier to the scaling of innovations was associated with financial resources, and most pronounced if projects were in receipt of funding that came to an end after a predefined time. The conclusion from the review was that organisations needed further support in the form of resources in order to sustain innovation. The niche level project has been well funded, but in scaling out, it is key to understand the level of financial resources allocated for community participation. Early indications are that resources are not readily available. The study concurs with Baker et al. (2026), in which the individuals known to be adopting and driving inclusive engagement practices are calling for crucial, dedicated resources (Baker et al., 2026). As Shaw (2012) stresses, if a local authority should be innovative, with strategic leadership that enhances community involvement of civil society, then to do so they require funding (as cited in Chmutina et al., 2016). It is again particularly important to further understand and overcome the dominant top-down culture, that underpins current structures and crucially affects the level of resources available for community engagement.

Shared reflections through the research approach and qualitative study of social innovation has since changed participants' perception of what innovation is within the project. Most innovation taking place more broadly in local government is as a result of pressure from central government and/or wider society, encouraged or driven by regular and ongoing evaluations of the efforts using formal measurement tools (Park et al., 2021). Within this sector of flood risk management, it is currently doubtful if the economic and efficiency focused programme level evaluation will capture the project's social innovation processes and meet the known need for a meaningful evaluation of both delivery outcomes *and* the quality of participatory processes (Geekiyanage et al., 2020; Head, 2007).

5.2 Implications for scaling social innovation

The transition studies literature suggests that organisations supporting the development of innovations should create an innovation 'niche', that is a safe space that is shielded from the more day to day operational concerns of the organisation in order to nurture and empower innovation (Moore et al., 2015). Sustaining innovation following the pilot stage is known to be a particular challenge, particularly when the 'day to day' frontline professionals have not fully bought into the original pilot (Currie et al., 2025). So, for Project Groundwater, it is not unusual that the innovation was largely detached from any form of community-focused organisational unit, but it is significant to observe that the engagement expertise has been contracted and thus leaves when the project funding ends. It has been previously observed that less mature forms of scaling initially focus on diffusion, then social innovators gain confidence and look for wider system change, looking to change the dynamics that has given rise to the problem in the first place (Moore et al., 2015). This is true of Project Groundwater; greater emphasis has been given to scaling out by centring ambitions on spreading or disseminating the results to more people. Scaling out works on the niche scale, essentially looking to develop more niches (Moore et al., 2015). However, the project was externally funded, which although meant the

innovation 'niche' was less impacted from the pressures of day-to-day service pressures, this has implications for sustainability and could limit the effect of innovation diffusion to other communities. Work has only more recently begun to focus on the wider geographic 'scaling out' and the need to impact the wider social system, namely the project funder and key institution of the Environment Agency.

6. Conclusion and recommendations

Over the past decade, there has already been a change in England's flood risk management policy emphasis on communities, risk management authorities and other key stakeholders being urged to 'work together' and sharing responsibility (EA, 2020). Technical needs and considerations have often overshadowed the ethical and social considerations of flood management (Scott-Bottom & Roe, 2020). Yet flood resilience is only seen to be legitimate if governments shift from steering exclusively in a top-down fashion, to involve other actors in decision making (Hegger et al., 2016). It is important to consider how to move "from the rhetoric to the practice of what resilience might look like in the context of FCERM in England" (Twigger Ross et al., 2020, p. 7). This study has responded to a need for research in implementing social innovation, and furthermore the implications for sustaining or scaling social innovation in a local flood risk management authority context. As the literature is limited in flood risk management, the paper has drawn upon literature across sectors and disciplines, notably public administration in the health and social care sector. Community resilience has been shown to require more than technological solutions (Kelly & Kelly, 2025), it also involves changes in attitudes, building trusting relationships for a greater awareness of community capacities, to meet needs through new interdisciplinary processes.

Flood 'resilience' is frequently used in a positive way, and many authors and policy makers do see the shift to resilience as empowering communities, fostering more adaptability through open and inclusive participatory processes. However, it is also argued that authorities encourage and target interventions on the public to change their behaviour and form new habits, with public policies increasingly relying on a less participatory but more individualised "responsibilisation" (Felix et al., 2024), part of a latent trend in shifting responsibilities for risk, from state funded protection to individuals, driven by cuts in government spending that in particular impacts disadvantaged groups (Potter & Fitton, 2023). If we are genuinely supporting communities in the shift from protection to 'resilience', then this requires relationship building and support over the long term. The risk is Project Groundwater's social innovation will fail to be sustained beyond their initial pilot, as documented by Currie et al. (2025) this is more likely in the face of financial pressures when 'frugal innovation' looks to achieve 'more for less' (Currie et al., 2025).

The particular cultural context of local and national flood risk management is argued to underpin the scaling of social innovation. If scaling is unsuccessful, then the project-by-project nature of community engagement has key implications for building trust. Current engagement processes provide communities with only a limited time for building trust with decision-makers to achieve results (Geekiyange et al., 2020). Trust and confidence can only be generated over the long term, requiring substantial effort and commitment (Fitton & Wilson, 2026; Head, 2007). Conversely, a project-by-project nature

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of engagement with the intermittent disestablishment of bodies, is known to generate trust and legacy issues, meaning any progress can be wiped out, with a resultant reluctance from communities to commit time and energy to engage in another initiative, that could also become defunct (Ford et al., 2020). The intent of this study was to surface social innovation, but then also look to focus attention on the strategies and ingredients required for scaling, so that the social innovation does not sink from sight again, when the project funding ends.

Moore et al. (2015) introduced the need for 'scaling deep' to capture the notion that durable change only occurs when cultural roots are impacted, in order to change beliefs about an issue (Moore et al., 2015). The underpinning or "elementary" link to culture has been stressed that innovations in water management "are value-laden and cannot be diffused and adopted without struggle and negotiation….The fit between innovation and values is elementary" (Van Buuren et al., 2015, p. 695). The project's prospects for scaling innovation in participatory processes is thus argued to be underpinned by a need for culture change, including at the national level.

6.1 Recommendations for scaling social innovation

First there is a need to focus on the importance of senior-level leadership, a willingness and the engagement of the wider employees at the local level underpins an organisation's innovation capability (Currie et al., 2025), i.e. for Project Groundwater to engage with other local authority leaders. This should include influencing political members to ensure a receptive audience and context for the continuing innovation journey (following Currie et al., 2025). Second, the project was fortunate to have specialist engagement professionals as part of the wider partnership, hence there is a need to identify the skills and competencies of community engagement and empowerment experts, to transfer the learning and innovation and identify the areas that need to be developed that meaningful engagement continues with communities (following Geekiyange et al., 2020). Third, there is also a need to reconsider the current administrative structures to support community participation - addressing participatory spaces, levels of engagement and addressing power dynamics, otherwise weak structures will curtail participatory processes. Fourth, it is also important to reflect more on where the change required lies within broader institutions, that efforts should be addressed to influence change or develop new policies or frameworks – to scale up. These questions need exploring in the legacy strategy, after seeking further understanding of scaling out at a local level, to consider and set out the policy drivers or support required to sustain innovation at the local level. Rather than a 'nice thing to do', it should be considered if community participation needs to be mandated (following Wittels, 2023). Fifth, as scaling innovation often requires new funding, or entirely new funding models to build internal capacity, then it should be considered where further investment is required, including in human capital through training. Finally, sixth, forming partnerships will strengthen the effectiveness of advocacy for social innovation (Bresciani & Tjahja, 2025). Project Groundwater have joined forces on the technical elements of the project in addressing groundwater flood risk, which should be extended to adopt a more proactive approach in considering community engagement.

6.2 Study limitations and call for further research

This study on social innovation is far from comprehensive, with a single case, focused on community participation. The qualitative nature of the study has enabled a richer understanding and insights into the social innovation process from the participants' perspectives. Further qualitative insight into the need and implementation of social innovation from the community perspective and comparative studies across other flood authorities in different contexts require further investigation and understanding. Quantitative studies across multiple 'samples' of innovation would allow greater generalisation of the findings. Notably due to research funding constraints tied to the project timeline, the study has been limited to date to a study of the planning process for the project's legacy. Innovation scaling clearly represents a complex process over a much longer time period. It would be extremely beneficial to study any success of the legacy strategy, the persistence of the innovation beyond the time period of the 'pilot', with close contact being maintained with the authorities concerned to study any embedding and scaling over a longer time period. This form of a longitudinal study would enable a more dynamic understanding of how Project Groundwater (or another social innovator) has sustained innovation, or how and what challenges hindered or ended the innovation journey, in particular, if scaling deep is a step too far from the niche level. In 'scaling deep', the unit of analysis should shift from one local authority led project and turn to the national level or systems. The authors join Baker et al. (2026) in calling for further research on how to shift culture within organisations, otherwise listening to community voices will remain "situated on the periphery" (p. 15) rather than becoming mainstream and meaningful.

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