

Science and Evidence for Place-Based Adaptation



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Executive summary

Context and scope

The Scottish Government (SG) has a duty under the Climate Change (Scotland) Act 2009 to update the Scottish Climate Change Adaptation Programme (SCCAP) every 5 years. Adaptation Scotland (AS) is a programme funded by SG to help deliver the SCCAP, through helping organisations, businesses and communities across Scotland to understand what climate change will mean for them and to identify the best way for them to plan for the impacts.

Through discussions with colleagues in the Climate Change Policy Implementation Unit and in AS, the Scottish Science Advisory Council (SSAC) identified an opportunity to potentially strengthen delivery of future SCCAPs. Specifically, this was through facilitating links between the academic community (primarily social scientists) and adaptation initiatives at community level to build a better evidence base to inform development of further phases of the SCCAP. This led to the creation of a short-life SSAC Working Group (WG)¹ to steer the project.

The small amount of resources (money and time) available meant that this project could only be an initial evidence gathering exercise to identify priorities for more substantive projects in this relatively under-researched area. The WG agreed that the aim of this project (see Scoping Agreement for more detail)² was to:

- i. “set the scene” of recent and current research and development projects on place-based adaptation (PBA) across Scotland with reference to their strengths and weaknesses;
- ii. identify potential research questions that could strengthen the delivery of PBA; and
- iii. provide reflections and recommendations to the SG that could inform the development of the next SCCAP.

Given the small scale of the project and primary emphasis on social science, the WG agreed that the project would focus on two specific outcomes of the SCCAP, namely:

1. Our communities are inclusive, empowered, resilient and safe in response to the changing climate (Outcome 1);
2. The people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy (Outcome 2).

The approach adopted included: a) a literature review to help design an online questionnaire and semi-structured interviews ([Annex A](#)), and b) a virtual roundtable ([Annex B](#)) of key stakeholders from academia, the public sector, the third sector, and from communities already undertaking work badged as “adaptation”. This report draws on each of these sources of evidence (details given in Annexes A, C and D) and knowledge from within the SSAC to draw out insights, research questions and reflections for the SG in developing the next SCCAP.

1 The WG included SSAC members SG policy officials, academics and AS staff

2 [Scoping Agreement – Adaptation – Oct 2022.pdf \(scottishscience.org.uk\)](#)

Key insights

i. Setting the scene of recent and current research and development projects on PBA across Scotland:

- Only eleven responses were received in response to the online questionnaire ([Annex A](#)), while the roundtable attracted forty five attendees. Other SSAC studies and the experience of those on the WG have identified more place-based activities addressing adaptation, while not “badged” as such. These include projects associated with, e.g., local food production, regional land use, catchment management strategies and climate action networks.
- The lack of documentation of existing projects in terms of impact, reach, learning, and outcomes makes it difficult to define what success might look like and what is (or is not) good practice.
- There was recognition that climate change will affect not just the physical features of a “place” but also established cultural traditions, identities, and the social fabric of communities – all of which differ between groups and areas.
- There is more demand for collaboration across sectors as well as demand for innovative approaches to financing, governance, and democratic practices.

ii. Suggested research approaches and questions

- The **need for accessible data** and the potential for developing “models for action” was emphasised by stakeholders at the roundtable. Consideration of new economic models should be included.
- There are examples of good practical initiatives on adaptation; for example, Climate Ready Clyde (CRC). However, what is currently missing is empirical research to identify and understand in more depth what have been the factors behind success – and what has not worked – and how successful **initiatives can be rolled out at scale** (e.g. sharing experiences between regions with similar priorities).
- Over the past 10-15 years, both the SG and the Scottish Funding Council (SFC) have established collaborations between universities and research centres to undertake research at the science/policy interface.³ Resources within these boundary organisations could be harnessed to help **develop a shared vision of PBA**, and ensure the objectives, timelines of delivery, and access to resources are locally appropriate and acceptable, while also contributing to a national strategy.
- The need for inter-disciplinary research approaches is clear. Social science could play a key role in defining **targeted methods and approaches to community engagement to ensure participation of “hard to reach” groups**. Engagement with other disciplines is essential to help identify practical options.

³ e.g. the SG’s [ClimateXChange | Scotland’s centre of expertise on climate change](#), [CREW | Scotland’s Centre of Expertise for Waters | Connecting Water Research and Policy](#) and the SFC’s [Scottish Research Alliance for Energy, Homes and Livelihoods \(sfc.ac.uk\)](#)

iii. Reflections on strengthening the next SCCAP:

- SG policies already recognise key principles of place-based working, such as collaboration, partnership, and cross-sectoral thinking. Innovative thinking on how to leverage multiple sources of funding (including research) to stimulate appropriate initiatives should be considered.
- There are legal requirements for collating and managing data (GDPR),⁴ resulting in extensive protected databases which are not always accessible at a local level. Finding ways in which to communicate the need for data collection so that it is seen as a way of ‘giving back to the community’ could help with systematic prioritisation of local issues and help to resolve potential conflicts. Identifying champions to promote data awareness might be beneficial – presumably the [Digital Office | Scottish Local Government](#) could help with this.
- Local authorities are often too budget and human resource constrained to lead local action and some communities may have stronger leadership within the community than others. Social science research may be able to suggest ways of efficiently accessing expert advice at a local level to help develop more equitable resource distribution across Scotland.
- Further development of the national “framework” (or strategy) for adaptation could include mapping of local and regional priorities (based on local authority strategies, regional land use plans etc).

Introduction

There is a growing recognition that addressing climate change and a just transition requires complex social and economic transformations. Given Scotland’s regional diversity, a place-based approach represents an effective way to deliver a positive outcome for both people and communities. Although there are many place-based initiatives in Scotland, cumulative evidence of their successes, lessons learnt, and challenges overcome is less well understood. The framing of ‘adaptation’ on community ‘resilience,’ and the framing of ‘place’ on Scotland’s policies such as the National Performance Framework and National Programme for Government, demonstrate the increased political commitment to accept and support place-based actions.

There is also a recognition that a pathway to Net Zero requires a comprehensive and integrated approach that harnesses the synergies and interdependencies between adaptation, mitigation and other Sustainable Development Goals (SDGs). For example, communities need help with adapting to climate change policies as well as to adaptation directly attributable to climate change. There is evidence of more recognition of the benefits of collaboration across sectors as well as innovative approaches to financing, governance, and democratic practices.

Policy context

The SCCAP is a requirement of the Climate Change (Scotland) Act 2009 and addresses the risks set out in the UK Climate Change Risk Assessment (UK CCRA) 2017, published under section 56 of the UK Climate Change Act 2008.

The SCCAP takes an outcomes-based approach, derived from both the UN SDGs and Scotland’s National Performance Framework. This cross-cutting approach promotes co-benefits and integrates adaptation into wider SG policy development and service delivery.

There are seven outcomes in the Programme which focus on both social (i.e. the knowledge and tools for communities to adapt to climate change) and physical (i.e. natural, built and historic) aspects of place-making and PBA. The emphasis of this report focuses specifically on evidence to inform Outcomes 1 and 2 which could potentially benefit most from links with social scientists.

4 [Data protection: The Data Protection Act – GOV.UK \(www.gov.uk\)](#)

1. Our communities are inclusive, empowered, resilient and safe in response to the changing climate (Outcome 1);
2. The people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy (Outcome 2).

1. Approach adopted

The methodology adopted was firstly to convene a short life Working Group (WG) to guide the project and help identify stakeholders working on adaptation projects in Scotland. The knowledge of the group informed the questions to be asked of stakeholders via an online questionnaire and semi-structured interviews with a mix of practitioners from academia, the public sector and community-led initiatives on PBA.⁵ These activities were undertaken and a report of the outcomes of these activities, incorporating a short review of relevant literature was produced by an intern (Ashrika Sharma, University of Edinburgh) working on behalf of the WG ([Annex A](#)). The survey and interviews were followed by a virtual roundtable event with participants from academia, the public sector, the third sector, and from communities already undertaking work on adaptation ([Annex B](#)). Group discussions at the roundtable addressed the following questions:

1. What are the particular challenges around PBA?
2. How can communities have a voice when initiating PBA, and remain influential throughout the process and beyond?
3. What are the right skills for different stages of building resilience, and what is missing?
4. What are the future science challenges for adaptation and how can they be integrated within the development of policy?

An analysis of all this evidence, together with the outputs from the roundtable ([Annex D](#)) was then undertaken by members of the SSAC which drew out the following insights on how current weaknesses could be addressed.

2. Setting the scene of current “adaptation” projects and a summary of challenges to PBA

The approach adopted to identify research projects (search of UK Research and Innovation (UKRI) grants website, University Department websites and discussions with Sniffer) identified a total of twelve projects engaged in adaptation at a community level in Scotland. Evidence from these, together with the literature review, led to the design of an on-line questionnaire, from which eleven responses (from ten organisations) plus semi-structured interviews with nine individuals working on the topic were analysed to create a table of strengths, weaknesses, opportunities and threats (SWOT, [Annex A](#)). The weaknesses included difficulties in communicating adaptation and documenting long-term impact of the projects.

Difficulties in the language around “adaptation” may have limited our ability to capture the extent of work on community adaptation in Scotland, since many relevant projects are not “badged” as adaptation. (Indeed, a recent SSAC study on “local food” ([SSAC Food Report](#)) identified considerable research on innovative approaches to adapting to changing climatic conditions as well as innovative use of renewable energy in local food businesses – which is “adaptation” to climate change policy). Attendees at the roundtable also brought experience of additional place-based catchment management projects which represent “adaptation” to changing rainfall patterns. A presentation at the roundtable ([Annex C](#)) by Candice Howarth, Co-Director of the Place-based Climate Action Network (PCAN)⁶ (funded by UKRI), also provided examples of adaptation projects at a local level across the UK.

5 The SG defines “Placemaking” as a “multi-faceted approach to revitalising, planning, designing and managing places. It involves working with local people to discover what their priorities are for their local areas.”

6 [LSE PCAN Enabling Place-based Climate Action in the UK: The PCAN Experience \(pcancities.org.uk\)](#)

3. Importance of local context and the skills and experience required to deliver PBA

PBA is influenced by a wide range of factors that shape the context and dynamics of a specific location. These factors can vary from one place to another and play a significant role in determining the effectiveness and success of adaptation efforts. Tailoring adaptation strategies to the specific needs and context of a place is essential for effective and sustainable PBA. A comprehensive understanding of these influencing factors can help agenda setting, prioritisation of actions and design and development of targeted interventions that build resilience and promote climate change adaptation at a local level.

Communities are heterogeneous, dynamic and challenging to define due to overlapping memberships, interactions, and interdependencies across different scales. The barriers and challenges which can hinder the effective and equitable implementation and community uptake of climate change adaptation measures and limit the community's ability to build resilience are highly variable. They are particularly difficult to assess – and remove – for “harder-to-reach” groups, which have less access to resources and services in the first place. Difficulties in ensuring representation and addressing social justice were identified as weaknesses of current projects in the SWOT analysis ([Annex A](#)).

Effective implementation of PBA requires a multi-faceted, multi-sectoral approach that involves power sharing across the community (i.e., sharing a vision, ownership, knowledge and language to communicate the complexity, proximity and impact of risks). This means building local capacity, fostering partnerships, securing adequate funding (over a long enough period), promoting inclusive decision-making, and aligning adaptation strategies with community values and needs. Enabling communities to share ownership of their adaptation efforts and facilitating knowledge exchange can help overcome certain challenges and lead to more effective and sustainable PBA.

Overcoming challenges and barriers to implementation within communities also requires political will, national, regional, and local support, capacity-building efforts, and active community engagement. These must be underpinned by the appropriate and necessary resources and accessible to communities at risk.

Embedding climate justice, sharing power, and building capacity in key stages of place-based adaptation demands partners' intellectual humility and fluency across different, diverse STEM (science, technology, engineering and maths) and SHAPE (Social sciences, Humanities and the Arts for People and the Economy) disciplines. These include environmental science, urban planning, social sciences, and engineering. An interweaving of approaches, methodologies, and insights is needed to develop holistic approaches and strategies.

Innovative approaches to financing, risk governance, and democratic practices are also needed to ensure place-based adaptation is effectively resourced and managed.

This study has made a start on listing existing community projects (see [Annex A](#)). However, there does not seem to be a systematic documentation of what is happening on the ground and an analysis of what has worked well and which skills have been helpful. Anecdotal evidence on appropriate skills has been collected but this should be added to through systematic studies on “what success looks like” in different local situations. The suggestions on relevant skills below are compiled from the different evidence sources:

At community level:

- How to raise awareness of changes taking place and how to identify specific priorities in local areas will be key.
- Data should underpin discussions on priorities – but knowing where to find relevant data and being able to assess its quality may be skills with which communities need help.
- Bringing together diverse stakeholders with a vision of shared responsibilities is critical to avoid clashes with conflicts of interest within and across communities. Exploring how to reach convergence through iterative dialogue and the development of solutions to avoid decision-making paralysis is fundamental.
- Skills for communicating with all parts of a community are also important to ensure inclusivity.

At local authority and regional levels:

- It is clear that PBA should align with local development plans and national agendas on climate change. However, action – and financial resourcing – cannot be left to local authorities alone. Other third sector groups and government funding sources already exist at regional and local levels. Mapping that landscape (across climate change mitigation, adaptation and the just transition)⁷ and understanding the commonalities and differences between groups could help with scaling up the impacts of successful initiatives.
- Meaningful and impactful PBA necessitates collaboration between communities, local authorities, regional organisations and the public sector. Innovative approaches to financing, governance, and democratic practices are also needed to ensure place-based adaptation is effectively resourced. Effective multi-sector and multi-stakeholder engagement must take into account power dynamics, and a shared leadership approach, where everyone is regarded as equal partners.

4. Suggested research approaches and questions

All the evidence points to the need for inter-disciplinary and multi-sectoral approaches, but specific barriers were also identified.

Addressing lack of data

Given the lack of data and insight on how the wider Scottish community is adapting to climate change, or not, is critical to informing the design of future SCCAPs. This is true particularly in the context of ‘inclusive, empowered, resilient and safe’ (SCCAP Outcome 1) which needs a deep understanding of community perspectives of what is working, what is not, and what is required in terms of support, guidance, training, skills development, and knowledge. This will be required for developing strategies for reaching those that are marginalised, ‘hard to reach’, and who are most vulnerable (SCCAP Outcome 2). Ensuring that the data are also accessible to, and interpretable by, local communities and capable of being scaled to regional and national levels is also important.

Scaling up across communities

As successful place-based adaptation initiatives are identified and the key influencing factors determined, research needs to consider how these practices could be replicated to reach a broader range of communities facing similar challenges.

⁷ For the Scottish Government a just transition is both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. It supports a net zero and climate resilient economy in a way that delivers fairness and tackles inequality and injustice.

Enhancing community engagement for PBA

Adopting novel methods and approaches to community engagement that can be used at scale needs to be considered further to explicitly include gender, race, ethnicity, sexual orientation, gender identity, disability, and class.

Consolidating PBA approaches into economic models

Learning lessons from individual PBA successes through evaluation of socio-economic impacts of adaptation measures and contributing to thinking about new (and more radical) economic models. This could include models for adaptation finance and action at different scales.

Addressing research and skills gaps will not only strengthen the evidence base for effective place-based adaptation – it will also contribute to more targeted, context-specific, and equitable climate change responses for local communities. Collaborative efforts between researchers, policymakers, and communities are crucial to ensuring the relevance and impact of future research on PBA.

5. Reflections on insights and next steps: making change happen

The approaches that the SG will take to mitigation and adaptation will be vital in terms of the contribution to bringing down carbon emissions and simultaneously supporting communities to adapt to the changing climate. There is a need for urgency.

In the context of the two SCCAP outcomes that this report was focusing on, priority policy questions are:

1. How do we ensure our communities are inclusive, empowered, resilient and safe in response to the changing climate (i.e. so that each place is planned, designed, and managed to suit the needs and aspirations of the people who live and work there) as well as wider benefits.
2. How can climate justice be embedded in climate change adaptation policy so that the people in Scotland who are most vulnerable to the negative impacts of climate change are able to adapt and to share both the benefits (i.e., from low carbon development) and burdens of climate change equitably.

Participation in the roundtable brought together people working in community groups across Scotland from the islands to cities with academics from across the UK and illustrated the difficulties of some of the language around “adaptation”. The need for making information and data accessible within communities was stressed, but also the need for success stories (and barriers) to be shared regionally and nationally. Sharing skills and experience between communities could be facilitated, while recognising differences in the actual social fabric of communities, alongside cultural traditions.

There are a number of mechanisms that can be used of which PBA is one. Just transition is another concept which is gaining much traction not only in Scotland but internationally. To date there is not one magic formula for delivering this, since a transition approach will be country- and context-specific. Successful adaptation is an ongoing and iterative process that requires:

1. Ways of working to effectively share knowledge and increase community awareness, co-operation, co-ordination, and collaboration in an equitable and sustainable manner.
2. Continuous learning and engagement with communities.
3. Ethical risk communication (i.e., transparent, independent and timely) within communities and between communities and other decision-makers

4. Monitoring (i.e., continuous and regular internal processes for making sure that the activities under the programme/project are on track) and evaluation (i.e. systematic ways of collecting, analysing and using information to answer basic questions about a project/programme) of impacts in order to improve long-term outcomes, accountability, and trust.

The principles of climate justice could underpin and connect PBA with the just transition. Opportunities to embed procedural justice (fairness of a process), distributive justice (benefits and burdens of an action), inter-generational justice (fairness of action for different age groups), and restorative justice (addressing a historical injustice) could be mapped into the developing framework. The three pillars of wellbeing, environmental sustainability and economic prosperity should underpin considerations in all the key sectors – including energy, housing, agriculture and land use, land transport, and aviation. Identifying commonalities in terms of aspirations, goals, and targets and aligning investment and/or funding with relevant collaborations may help to accelerate progress.

6. Conclusions

The National Performance Framework and Programme for Government make explicit the political support for place-based actions and the framing of ‘adaptation’ around community ‘resilience’. This SSAC report has started to map out some of the PBA work being undertaken in Scotland, but there are other areas of both research and community projects which can contribute to ‘community resilience’ which are not ‘badged’ as adaptation. Ideally all these studies need to align both with the local development plans and national agendas on climate change which presents a considerable challenge.

Further mapping of place-based projects alongside local development plans could be a useful next step. The SG has budgets to commission research directly from its Centres of Expertise (such as ClimateXChange and CREW) and the Scottish Funding Council has created Alliances for Research Challenges to leverage wider funding to address SG priorities. These boundary organisations⁸ may provide opportunities to undertake a more in-depth study with the aim of highlighting some of the commonalities between approaches to mitigation and adaptation.

Faster delivery of the ambitions of future SCCAPs would also be aided by a more systematic recording of information, data and evidence of successes and failures from the projects already underway. A co-ordinating framework (and pragmatic standards to ensure accessibility of information and data) could help to ensure that lessons being learnt in one place can provide inputs into other initiatives and thereby accelerate progress at national level.

7. Acknowledgements:

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8 [Boundary organizations and environmental governance: Performance, institutional design, and conceptual development – ScienceDirect](#)



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