Land Use and Climate Change Adaptation in Scotland: Insights

2023

Adaptation Scotland

supporting climate change resilience

The Adaptation Scotland Programme is funded by the Scottish Government and delivered by sustainability charity Sniffer.

Adaptation Scotland provides advice and support to help organisations, businesses and communities in Scotland prepare for, and build resilience to, the impacts of climate change.

Contact us:

adaptationscotland@sniffer.org.uk

www.adaptationscotland.org.uk

@Adaptationscot

Authors
Iryna Zamuruieva, Cat Payne, Ruth Wolstenholme, Jonny Casey, Ben Connor, Alex Cameron-Smith

Acknowledgements
The project team would like to express their gratitude to all the interview participants for taking the time to share their knowledge and views. Thank you to Iain Thom, Keith McWhinnie and Emma Cooper for their valuable contributions to co-designing this project. Thank you to Emma Yule for the methodological recommendations. Thank you to Clive Mitchell and Debbie Bassett for helping strengthen the report. Thank you to the whole team at Sniffer for support.

Please cite this report as
Zamuruieva, I., Payne, C., Wolstenholme, R., Casey, J., Connor, B., Cameron-Smith, A. (2023) Land use & climate change adaptation in Scotland: insights. Commissioned by the Scottish Government and produced as part of Adaptation Scotland programme.

Graphic design: Savannah Vize
Cover image: Glen Garry, Invergarry. Photo by Tim Rüßmann, via Unsplash

Sniffer, Edinburgh Climate Change Institute,
High School Yards, Infirmary Street,
Edinburgh, EH1 1LZ

0131 651 4674

info@sniffer.org.uk

www.sniffer.org.uk

@SnifferScotland

Scottish Charity No SC022375, Company No SC149513. Registered in Edinburgh. Registered Office: Caledonian Exchange, 19a Canning Street, Edinburgh, EH3 8HE.

Adaptation Scotland

supporting climate change resilience

sniffer

knowledge brokers
for a resilient Scotland

St Abbs Head Nature Reserve. Photo: ScotGov Rural, via Flickr.

Contents

Executive summary

Introduction and background

The climate and nature crises mean that decisions that relate to how Scotland owns, uses and manages land must address climate change as an imperative. Climate change will have significant impacts on land, and implications for land use. Even if Scotland achieves its emission reduction targets, a significant degree of climate change is already locked into the system, making further, greater changes inevitable. Current level of global governmental actions and policies will lead to a warming of 2.7°C by the end of the century and will also continue to rise after that date (Climate Action Tracker, 2022). This means the need to anticipate and adapt, with changes to the way we use, manage, and live on our land are a core part of Scotland's adaptation.

Purpose and approach

This report sets out to understand the relationship between land use, ownership and climate change impacts in Scotland. It presents a range of views expressed by interview participants from within 38 stakeholder organisations including some of the largest community, public and private estates, key land and climate membership organisations and policy makers from different sectors. It also builds on a brief review of the existing documentation on land and climate adaptation and resilience, media reports and publicly available information. It sets out current perceptions, the barriers to including adaptation in land-related decisions, and identifies priorities to enhance climate change adaptation and resilience in the context of land use and ownership in Scotland. The report is designed to inform the development of a number of upcoming policies and programmes including the next Scottish Climate Change Adaptation Programme, the Land Reform Bill, the Agriculture Bill and the Just Transition Plan for Land Use and Agriculture.

The policy context

Scotland's Land Use Strategy notes that we will not be able to adapt to climate change without changes to the way we use, manage, and live on our land. Climate change adaptation is not just another demand placed on Scotland's land. With climate change becoming more severe, ensuring Scotland's land and land-based activities are well-adapted to these changes, is essential. This includes adaptation to support livelihoods, nature restoration, food production, economic prosperity, housing, and supporting people's health and wellbeing.

Scotland is undergoing a period of significant policy change in relation to land use. Recently published policies including Scotland's third Land Use Strategy, Land Rights and Responsibilities Statement. National Planning Framework 4, Agricultural Reform Route Map and the Biodiversity Strategy provide a new strategic context for decision-making. This policy context will evolve further through the key policies and legislation currently under development, including the Agriculture Bill, Land Reform Bill, Flood Resilience Strategy, and the third Statutory Climate Change Adaptation Programme. This is complemented by emerging delivery structures such as Regional Land Use Partnerships, and the development of new markets for private investment in natural capital.

This moment of change is therefore a vital opportunity to ensure that Scotland's evolving approach to land use, management and ownership supports our national climate change adaptation objectives.

Findings

Findings from the review of literature and documents shows gaps in available analysis on the intersection of land use, ownership and climate change in international and UK specific context. There is currently no single strategy to ensure that land use (including farming, forestry, subsistence, housing) across urban and rural places in Scotland is climate ready and reports related to the topics of climate change, land use and ownership in Scotland, tend to omit adaptation and resilience altogether, focusing solely on mitigation.

Findings from the interviews are presented under three themes:

- Perceptions of the relationship between land use, land ownership and adaptation: existing knowledges and resources
- Perceptions of climate and land policies: intentions and on the ground effects
- Decision-making, relationships and power dynamics

Implications for enhancing climate change adaptation and resilience in the context of land

We consider what the findings mean for enhancing climate change adaptation and resilience in a land context. This includes the need for:

- Building knowledge and skills to address adaptation
- Communicating adaptation and resilience
- Linking up policies to embed adaptation and resilience
- Understanding power and building relationships to advance adaptation and resilience

Priorities

Based on findings from the interviews with stakeholder organisations, this report identifies priorities for enhancing climate change adaptation in the context of changing land use and ownership in Scotland. These priorities are relevant for government and others such as membership organisations who work with land-based businesses and communities, estates, farmers, and development trusts.

Priority 1: Improving knowledge and resources for adaptation

Priority 2: Connecting climate and land-related policies' intentions and delivery

Priority 3: Working towards more fair and just decision-making in land use

Please see further detail in the **following section**.

Next steps

This report has been developed to inform discussion within Scottish Government and ultimately a wider audience. Sniffer, as the authors and as part of delivering the Adaptation Scotland Programme, would be pleased to continue the conversation with the participants of this research, the Scottish Government and other stakeholders to work towards enhancing climate change adaptation and resilience in land use and ownership context in Scotland.

Priorities

This section identifies priorities, based on research and interviews with stakeholders for enhancing climate change adaptation in the context of changing land use and ownership in Scotland. These will be of interest and relevant to the Scottish Government and others, such as membership organisations who work with land-based businesses and communities, estates, farmers, development trusts, who are involved in land-related work and decisions.

The priorities are presented under the three themes that echo the research findings and analysis:

- Improving knowledge and resources for adaptation
- Connecting climate and land-related policies' intentions and delivery
- Working towards more fair and just decision-making in land use

Priority 1: Improving knowledge and resources for adaptation

1.1 Build a starting[1] level of awareness of climate change impacts and implications for different types of land use now and in the next decades.

This would involve working with key land use membership bodies (Scottish Land and Estates, Scottish Tenant Farmers Association, National Farmers Union Scotland, Landworkers Alliance Scotland, Community Land Scotland and Community Woodland Association, Development Trust Association Scotland) to address the interests of estates of all sizes, including farming, forestry and mixed-use medium, small and large estates and holdings. It should build on supporting evidence and data that is currently available but not widely known including the Climate Change Commission's **"Is Scotland climate ready? – 2022 Report to Scottish Parliament** and **Evidence for the third UK Climate Change Risk Assessment (CCRA3) Summary for Scotland** that both include helpful starting points for understanding climate change implications for land use.

1.2 Improve the quality of statutory advice and industry support to businesses, public bodies and community organisations.

This should include use of the most up-to-date **Climate Projections Summary for Scotland** and ensuring that climate adaptation issues are addressed in all relevant guidance. Our research indicates that 'climate risk' may not be the most suitable framing for adaptation communications, and that alternatives such as regeneration, community wealth building, maintenance and repair should be explored. The approach and framing would benefit from being developed together with membership bodies with in depth knowledge of the target audience.

1 See adaptation maturity stages in **Adaptation Capability Framework**

1.3 Target funding to support community groups, households and land-based businesses.

This could include working with:

- **Community membership organisations** such as Development Trusts Association Scotland, Scottish Flood Forum and others to provide **direct funding for household flood resilience measures** as well as **community-owned flooding data collection** (such as **RiverTrack**), catchment-scale funding for Natural Flood Management and long-term community group funding. It's vital that public and membership bodies responsible for statutory advice proactively support people who are most vulnerable to climate change.

- **Farming, forestry and mixed-use estates membership bodies** to establish financing for infrastructure resilience projects, agroecological farming and general maintenance

- **Community stakeholders** to design funding schemes that take the different resilience needs of Scottish islands, rural and urban places into account.

1.4 Integrate existing robust data on land use with most up-to-date climate impacts relevant to land use and general features of resilience.

This could include linking together the **UKCEH Land Cover Maps** with the land-specific risks and opportunities in the **Evidence for the third UK Climate Change Risk Assessment (CCRA3) Summary for Scotland** and the **Research to update indicators which monitor progress in adaptation**. See for example Dynamic Coast's **Map of coastal erosion disadvantage in Scotland** that brings together Social Vulnerability Classification Index (SVCI) and Erosion Vicinity that includes assets which may be affected by coastal erosion/loss of other assets such as roads and infrastructure.

1.5 Explore opportunities to embed adaptation requirements into existing funding streams.

For example, as direct payments (see more in Priority 2.3), Scottish Land Fund grants, National Lottery Community Fund and others; **and investigate innovative tax collection and redistribution proposals** put forward by Scottish and UK-based climate and social advocacy groups and think tanks, such as Scottish Land Commission's work on **tax and land property**, Common Weal's **property tax policy proposals** and IPPR's work on **local tax powers in Scotland**.

Priority 2:
Connecting climate and land-related policies' intentions and delivery

2.1 Ensure climate change adaptation action is embedded in the new agricultural payments system.

This is a key opportunity to incentivise and mainstream adaptation at scale in rural land use decisions. There are opportunities to embed adaptation in all tiers:

- Tier 1 and Tier 2 'Direct payments' should include adaptation measures as standard conditions, not just guidance;
- Tier 3 'Elective payment' should support changes to land use that increase resilience, and adaptation needs to be integrated across all options;
- Tier 4 'Complementary support' should ensure adaptation and resilience knowledge is part of the new skills, CPD and training as well as included into the measurement tools

2.2 Ensure the implementation of the Scotland's Land Use Strategy at the regional levels includes adaptation and resilience.

Developing an integrated land use approach that would join up the planning of land use for food production, biodiversity conservation and regeneration, mitigation and adaptation in both rural and urban areas. If sufficiently resourced, Regional Land Use Partnerships could be a suitable vehicle for translating the national objectives into locally appropriate solutions.

2.3 Include adaptation requirements as part of Land Management Plans within the Land Reform Bill.

This needs to be carefully managed, given that the pressure to comply with the new legislation will be experienced differently, depending on organisational resources. For example, those with more resources, such as paid staff, allocated paid time to complete the plans and access to knowledge will be in a better position to complete assessments and gather relevant information than those with fewer resources. Working together with those who have voiced concerns over how this might be implemented (such as community landowning groups who are often reliant on volunteer labour) to explore the best ways to address adaptation and longer-term resilience will be essential for the success of these plans.

2.4 Set up policy-practice knowledge exchanges on land and climate-related topics.

This could link up the planning and delivery of Biodiversity, Net-Zero, Agriculture, Land Reform policies and would help to build trust and relationships amongst both policy teams and affected people and organisations. For example, this could be achieved by organising policy fieldtrips (as an alternative or additional method to public consultations) into land-based organisations, such as farms, estates, community trusts that own and/or manage land.

Priority 3: Working towards more fair and just decision-making in land use

3.1 Work with the land-owning community groups, both urban and rural, to incorporate local and indigenous knowledges and historic understanding of climate vulnerability into climate and land policies and decision-making structures.

This could explore integrating the land-use implications outlined in the CCC's report on **Just Transition and Climate Change Adaptation** with Gaelic concepts (such as *buntanas, cianalas* and *dúthchas*) that allow a more complex and grounded understanding of relationship between people, land and climate. This could also integrate SEPA data with locally owned flood and other data and on the ground experiences of working with the land.

3.2 Include adaptation in the Interim Principles for Responsible Investment in Natural Capital and Responsible Natural Capital and Carbon Management Protocol (part of the suite of Land Rights and Responsibilities Protocols).

This could ensure that adaptation is perceived equally as an essential element and responsible good practice of natural capital and carbon management by the landowners, managers and investors. A longer-term focus should encourage a conversation on the value of land seen not merely as a financial asset, but through the lens of environmental rights, widening the conceptual frame of possibilities.

3.3 Ensure decisions relating to land made by the public and private sector include a robust, wide-ranging and inclusive community engagement process and are informed by the understanding of climate change impacts.

Whilst there are positive examples of land-related community engagement across Scotland, more should be done to integrate guidance on adaptation and resilience with the existing Scottish Government's guidance, such as **Engaging communities in decisions relating to land**, Scottish Land Commission's route map **Community Engagement in Decisions Relating to Land** and research on **Engaging and empowering communities and stakeholders in rural land use and land management in Scotland**.

Photo: Elena Jiang, via Unsplash

1. Introduction

The resilience of Scotland to the impacts of a changing climate is closely related to how land is used and owned. In delivering the Adaptation Scotland programme, Sniffer has set out to understand this relationship.

The purpose of this report is to share insights and offer priorities to enhance climate change adaptation and resilience in the context of land use and ownership in Scotland.

This report presents the range of views expressed by the interview participants, structured under the themes that emerged from the analysis. It also builds on desk-based research of land use and climate change literature, drawing on policy documents, peer reviewed academic articles, reports and publicly available documentation from industry events.

The report is designed to inform the development of a number of upcoming policies and programmes including the next Scottish Climate Change Adaptation Programme, the Land Reform Bill, the Agriculture Bill and the Just Transition Plan for Land Use and Agriculture.

The approach comprised interviews with 38 stakeholder organisations (listed in **Annex 1**) representing various areas of policy and practice in land use, land ownership and climate change. Participants included some of the largest community, public and private estates, key land and climate membership organisations and policy makers from different sectors.

The interviews were structured around three questions:

1. How do different stakeholders understand the relationship between land use, land ownership and climate change in Scotland?

2. Depending on the land use context, what are the barriers to taking action on adaptation and climate resilience?

3. What changes are needed to embed adaptation in land-related decisions?

The report sets out current perceptions, the barriers to including climate change adaptation in land-related decisions, and the priorities to embed climate change adaptation and resilience in land-related decisions in a way that contributes to a fairer and flourishing Scotland.

2. Background and context

2.1 Land use and climate change impacts

The climate and nature crises mean that decisions that relate to how Scotland owns, uses and manages land must address climate change as an imperative.

Climate change will have significant impacts on land, and this has implications for land use. Even if the future greenhouse gas emissions fall rapidly, a large amount of carbon dioxide is removed from the atmosphere and Scotland achieves its emission reduction targets, a significant degree of climate change is already locked into the system, making further, greater changes inevitable. TCurrent level of global governmental actions and policies will lead to a warming of 2.7°C by the end of the century and will also continue to rise after that date (Climate Action Tracker, 2022). In Scotland, this would bring warmer temperatures in all seasons, wetter winters and drier summers, more extreme weather events and sea level rise. These changes will have different impacts for different places, sectors and communities. This means the need to anticipate and adapt to these changes is urgent.

At a UK-wide scale, five of the eight priority risk areas identified in the technical reports of the Climate Change Committee's Independent Climate Change Risk Assessment (CCRA3). are related to land use, including: risks to the viability and diversity of habitats and species; risks to soil health; risks to natural carbon stores and sequestration; risks to crops, livestock and commercial trees; and risks to supply of food, goods and vital services. The nature of these risks in Scotland is outlined in more detail in the **Scotland summary of the CCRA3**. The Climate Change Committee report **Is Scotland climate ready? – 2022 Report to Scottish Parliament** highlights that despite climate changes already being seen in Scotland with impacts felt across society and ecosystems, the progress of adaptation has stalled. The report urges Scottish Government to raise the level of adaptation response.

Current land use, land use change and regulation are also key factors in enabling or limiting adaptation action in response to a much broader range of climate change impacts. These include increasing Scotland's resilience to flooding, managing extreme heat and drought and increasing food security as international supply chains become increasingly challenged by climate change. As outlined in **Scotland's Third Land Use Strategy** 2021-2026, we will not be able to adapt to climate change without changes to the way we use, manage, and live on our land.

2.2 A changing policy context

Climate change adaptation is not just another demand placed on Scotland's land. With climate change becoming more severe, ensuring Scotland's land and land-based activities are well-adapted to these changes is essential to ensure vital land-based activities remain possible in the future. This includes adaptation to support livelihoods, nature restoration, food production, economic prosperity, housing, and supporting people's health and wellbeing. There is a growing recognition of the need to take a more holistic, systems approach to land use that both delivers multiple benefits and recognises trade-offs.

Scotland is undergoing a period of significant policy change in relation to land use. Recently published policies including **Scotland's third Land Use Strategy**, **Scottish Biodiversity Strategy**, **Land Rights and Responsibilities Statement 2022**, **Agricultural Reform Route Map** and **National Planning Framework 4** provide a new strategic context for decision-making.

This policy context will evolve further through the key policies and legislation currently under development, including the Agriculture Bill, Land Reform Bill, Flood Resilience Strategy, and the third Statutory Climate Change Adaptation Programme. This is complemented by emerging delivery structures such as Regional Land Use Partnerships, and the development of new markets for private investment in natural capital.

This moment of change is therefore a vital opportunity to ensure that Scotland's evolving approach to land use, management and ownership supports our national climate change adaptation objectives. Decisions made now will have a significant impact on our ability to adapt to the changes in our climate that we are likely to experience more intensely in coming decades.

Photo: Ignacio Brosa, via Unsplash

3. Research methods

The project followed three stages:

Stage 1: Background research, stakeholder mapping

Background research included reviewing existing documentation on land and climate adaptation and resilience, in addition to related policy documents, media reports and publicly available information.

The review process provided an opportunity to draw together and document the understanding of existing perceptions of the relationship between land and climate change across the media and narratives in the public documentation of key sectoral organisations.

We used the review to identify 88 initial stakeholders to approach with an invitation to hold interviews. This was complemented by a Sniffer-wide stakeholder mapping workshop in which we further refined and prioritised up to ten stakeholders in four key categories:

- Large public and private landowners and managers
- Those representing community land ownership (and community voices more widely)
- Groups who currently do not own or manage land, but have a stake in the issue (such as industry membership organisations)
- Other key players in the land and climate field (who do not fall into either of the above categories, e.g. researchers, think tanks, coalitions)

Our approach built on extensive experience of working across community and policy levels on climate change adaptation, awareness of some of the existing power dynamics and power-aware research methodologies, such as those developed within political ecology and political economy disciplines (Elias, et.al. 2021, Sovacool, et.al. 2015, Urquhart, 2023). Focussing on the stakeholder categories above allowed engagement with people and organisations ranging from those with the power to make decisions, to those who influence decision making, all the way down to those mainly receiving information. To further refine the selection of participants we were guided by the analysis of role of power and influence in decision-making identified in a report comissioned by the Scottish Government: **Engaging and empowering communities and stakeholders in rural land use and land management in Scotland.**

Criteria for prioritisation of the stakeholders was guided by a key-informant sampling method, where we targeted people that are knowledgeable about the issue within key organisations in the field. We also used snowball sampling, asking our initial interview participants for recommendations for further interviewees. The final list of participating organisations is in **Annex 1**.

Within Sniffer we formed a long list of questions specific to each of the stakeholder groups. The questions were further refined and short-listed into sector-specific guides for the semi-structured interviews (See **Annex 2**).

Stage 2: Recruiting interview participants and conducting the interviews

We carried out 42 in-depth semi-structured online interviews (see **Annex 2**). The interviews lasted from 45 minutes to 75 minutes during which we unpacked participants' understanding of two broad topics:

- **Current relationships between land management, land ownership and climate change** in Scotland. The first half of the interviews were deliberately open - we did not use the term adaptation in the entry question - to allow for deeper understanding of how participants refer to and think of adaptation when unprompted. Here we looked at the general situation, interrelationships and challenges that participants see at the intersection between land management, land ownership and climate change (including their perception of climate risks and impacts and any adaptation actions), drilling down into their understandings of each.
- **The future of land ownership, land use and climate change** in Scotland. During the second half of the interviews, we explored participants' views on what changes are needed to bring about resilience and embed adaptation in land-related choices. The discussion of the changes was shaped by participants' knowledge and experience with specific practices, relationships, policies, partnerships and governance mechanisms.

Stage 3: interview analysis

We used an inductive (emergent) thematic analysis as the main method of analysis for the qualitative data: interview notes, transcripts and recordings. Rather than approaching the data with a set of pre-defined categories, we developed the themes as they emerged from the interviews. We used this approach to allow for new and unexpected insights to emerge and be captured, instead of identifying the themes in advance. Due to the semi-structured nature of the interviews, participants frequently brought up topics or connections not covered by the interview guide. We captured these to deepen our understanding of interviewees' thoughts on what is and is not relevant to understanding land use, ownership and climate change adaptation. Usually, the thematic approach focuses on what is being said, however in the **discussion section** we bring the interview statements in dialogue with research and wider discourses.

We use interview participants' understanding and thoughts on the current and future of land ownership, and land use and climate change in Scotland - including adaptation – to present the research findings. Within each we present the themes identified through several rounds of open and selective coding. Having created primary codes, we clustered them to identify emerging themes. Where possible we also provide insights specific to each of the stakeholder groups.

Through several rounds of coding of the interviews we identified the themes and key areas of interest and use the following weight of opinion approach to refer to the findings:

- **The most frequently identified** theme/ most participants: present in the majority (21+) responses
- **A prevalent theme**/many participants: present in many responses (15+ responses)
- **A recurring theme** noted by several/ some participants (10-15 responses)
- **A less commonly mentioned theme** noted by a few of participants or a (5-10 responses)
- **A more isolated theme** noted by a small number of participants or a singular comment (1-5 responses)

4. Key literature review

We undertook a brief review of the existing documentation on land and climate adaptation and resilience, media reports and publicly available information.

We found gaps in available **analysis on the intersection of land use, ownership and climate change in international and UK specific context.** There are several high-profile industry reports, such as one from **The Climate Change Committee (CCC): Is Scotland climate ready? – 2022 Report to Scottish Parliament**, **Land use: Reducing emissions and preparing for climate change, Evidence for the third UK Climate Change Risk Assessment (CCRA3) Summary for Scotland**, and UK Climate Risk Sector reports such as the **Agriculture and Food Sector Briefing, Land Use, Land-use Change and Forestry Briefing**, that include overviews of sector-specific climate change risks and opportunities. The overarching message from these is that current efforts to build Scotland's ability to adapt to the impacts of climate change in the context of land use and ownership are a patchwork of initiatives which needs to be addressed quickly to ensure Scotland is climate ready.

Most of the above reports are clear in that **there is currently no single strategy in place to ensure that land use (including farming, forestry, subsistence, housing) across urban and rural places in Scotland is climate ready**. Counter to academic calls to move away from sector-based approaches (such as agriculture, conservation, forestry and others) towards integrated landscape approaches (Reed et.al 2015, Peskett 2021), the reports above tend to focus on the technical elements and climate change implications for each sector. This includes specific impacts, risks and opportunities, often without mention of underlying power dynamics, social histories and political geographies that have shaped the interrelationships between climate change, land use and ownership in Scotland.

Other widely cited reports related to the topics of climate change, land use and ownership in Scotland, such as the Common Weal's and New Economic Foundation's **Our Land Report** are insightful for understanding the genealogy of current policy issues and proposed solutions. **However, these tend to omit adaptation and resilience altogether, focusing solely on mitigation**. There have been a few specialised research reports commissioned and carried out by ClimateXChange, such as **Land estates in Scotland: Perceptions of climate change and climate policy Implications for future policy support**. These often draw on a small range of research participants rather than a more in-depth understanding of climate vulnerability, as highlighted in the CCC's report on **just transition and climate change adaptation**.

Current media reporting tends to focus on the relationships between climate change mitigation and land use, only occasionally mentioning ownership. Some of the key focus areas in the media over the past five years have been the increase in land price driven by large-scale corporate land buy-outs for woodland planting and carbon capture and storage (fostered by Scotland's **'Net Zero' by 2045** policies) and highlighting the rise of "green lairds" in Scotland (Marshall, 2022).

Calls to move from adaptation to deliberate transformation or to frame climate change issues and adaptation as an "environmental justice" issue have been made for over a decade (see O'Brien, 2012; Walker and Burningham, 2011) and the understanding that certain demographic groups are more likely to be vulnerable to climate change impacts due to pre-existing social vulnerabilities has also been widely discussed (Lowe et al., 2013). The implications of climate vulnerability for land use and ownership have not received much attention in the UK, with research around these themes being focused on the Global South. In Scotland, there is ongoing work at the policy level to connect climate change adaptation with the just transition that pays specific attention to land use (CCC, 2022). Overall, climate change adaptation in Scotland is still at the early stages of building an evidence base for who is most vulnerable to climate change.

Rosemarkie. Photo: Julian Paren, via Wikimedia Commons

5. Findings

This section reports on the insights and impressions of the stakeholders interviewed. We begin by presenting different dimensions of response to **the first research question - how different stakeholders understand the relationship between land use, land ownership and climate change in Scotland, focusing on adaptation and resilience.** This includes participants' understanding of current and future climate change impacts, perception of the need to adapt and views on existing support for adaptation in a land use context (**Section 5.1**). We then present participants' understanding of existing and emerging policies relevant to the land use decisions and climate change adaptation and discuss their effects on the ground, where they enable or prevent adaptation and long-term resilience (**Section 5.2**). The final section looks at decision-making, relationships and power dynamics described by the participants as factors in enabling or inhibiting adaptation and resilience (**Section 5.3**). Within each sub-section we also report on the insights for the second research question on the **barriers to taking action on adaptation and climate resilience within the land use and ownership context in Scotland.**

5.1 Perceptions of the relationship between land use, land ownership and adaptation: existing knowledges and resources

Each of the interviews opened with a broad discussion of the participant's understanding of the relationships between land use, land ownership and climate change. The relationship between these was described as everything from "deeply problematic", "rooted in historic injustices, colonialism, imperialism, profit-driven logics, alienation from nature, disconnection from land" to the view that there is "not much relationship at all".

When asked about climate change, **most participants did not bring up adaptation as part of their responses** unless prompted. We found sectoral differences to these responses: whilst 70% of public sector participants acknowledged adaptation as part of their understanding of the relationship between land use, land ownership and climate change in Scotland, the number is significantly lower for the community and private sectors, 40% and 35% respectively. There was a **notably stronger emphasis on mitigation actions and Net Zero policies** in the way participants framed their understanding of climate change and adaptation throughout the interviews (see **Section 5.2.1** on The effects of the Net Zero policies and programmes for adaptation, resilience and community wealth building). This dynamic is further illustrated by the **perceived adaptation need:** public sector being highest, with 60% of interviewees from governmental agencies seeing adaptation as an urgent and immediate need; followed by most community sector participants seeing the need to adapt as high (58%) or medium (42%). Notably, participants from the private sector expressed only medium (60%) to low (40%) need to adapt. (Fig.1)

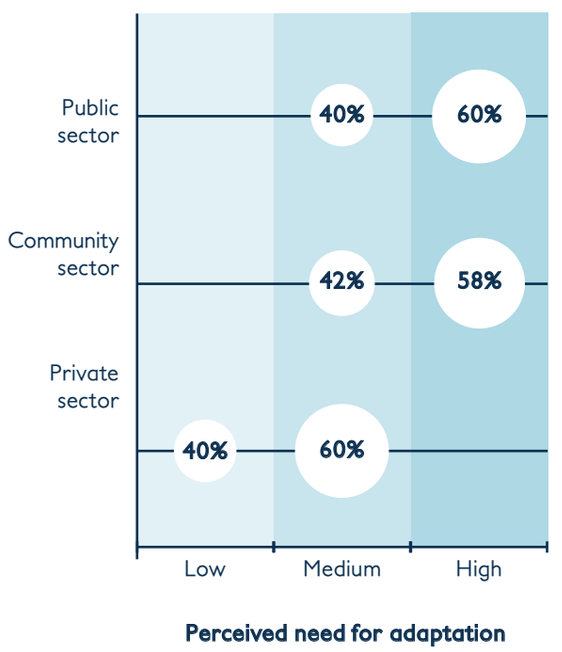


Fig.1 Perceived need for adaptation in different sectors.

> ***"We need to do adaptation. We need to do something about this. I don't know what."***
>
> **Public sector, landowner**

> ***"We have to face up to the fact that we are not going to do the 1.5 [degrees]"***
>
> **Private sector, landowner**

> ***"We are preparing to adapt to 1.5 [degrees] but we know it's not going to happen [...] Land management is not prepared, we're not prepared, we need to ramp up."***
>
> **Private sector, landowner**

The majority of participants highlighted a lack and inadequate quality of knowledge (whether their own, the people or organisations they represent or those they expect to provide them with information) and resources (including both guidance and material support such as funding) for taking action on adaptation and resilience.

The perception of the need to adapt was linked to participants' **awareness of climate change current and future impacts.** We used the four stages of the **Adaptation Capability Framework** to retrospectively evaluate participants levels of understanding of climate risks and vulnerabilities: "starting", "intermediate", "advanced" and "mature". We found that 74% of community participants and 80% of public sector participants demonstrated intermediate to advanced levels of awareness; whilst awareness amongst private sector participants and organisations they represent tended to be lower, with 60% at the very starting stage and remaining 40% at the intermediate stage. The examples of current impacts were often linked to specific issues, such as flooding (and consequences for homeowners), droughts (in relation to farming crops) and forestry (with effects for commercial forestry choices).

Amongst the participants who were more familiar with Scotland's adaptation goals and approach, both within public, community and private sectors, there was a sense of frustration both with the limited extent of adaptation action, as well as with the perception that Scotland is adapting to a less extreme version of a future climate than we are likely to see in reality.

There was an interesting trend in relation to participants' **sources of climate information**. The majority (87%) of the community sector and all (100%) private sector participants mentioned their own lived experience, observation and data collection, and conversations with others in the sector as main sources of climate information. Examples of these included information from local weather stations, regional discussion forums, and on-site environmental and weather data gathering approaches. We found that 55% of participants representing government bodies and agencies reported obtaining climate change information from public sector (or affiliated) communications. Some of the tools referred to as helpful in understanding climate impacts included Adaptation Scotland's **Climate Ready Places**. Most participants did not report using any climate risk themed data sources, such as the **Evidence for the third UK Climate Change Risk Assessment (CCRA3) Summary for Scotland**. Several participants from public and community sectors called for more map-based approaches to help understand what climate change means locally. They suggested that it would be helpful to be able to access user-friendly maps that allow climate impacts and land use to be viewed together.

Throughout the interviews there was a view that there is **insufficient, inconsistent or poor-quality statutory advice** received from government and agencies for community and private sector participants and organisations they represent. Some representatives of community groups pointed out: *"The weather's becoming more extreme […] there's an understanding about […] wildfire and floods […] we do need to prepare for the future. So, we're really hoping that we can help to restore the landscape in a way that is going to support resilience […] but it feels like we're not that well supported through statutory advice and I think it is a lottery of […] who you've got as your area officer."* (Third sector, landowner); *"If there were […] more advice how to adapt, rather than paying people do things differently, the knowledge […] would have the greatest benefits."* (Mixed use estate, Private sector). The need for more knowledge and building a base understanding of climate impacts was also echoed by participants speaking on behalf of regulatory and membership bodies across mixed use estates, farming and forestry. Many of these participants noted the need for knowledge exchanges and sectoral upskilling on holistic ways to address climate change through land use, such as forestry or farming methods.

> ***"With dredging, draining or taking away water, it doesn't help that SEPA's advice is 'flooding is your problem' […] and we're not thinking forward about the future, we're looking at managing it once it's happening and so this is a real struggle."***
>
> **Private sector, membership body**

The current risk framing of climate change was described by many participants across all sectors as problematic for variety of reasons, including:

- Not thinking about climate change in terms of risks
- Not seeing what climate change risks mean specifically in land use and ownership context
- Dealing with other pressures that presented more immediate challenges compared to climate change

> ***"There's a lack of trust and honesty, a sense that climate change is getting blamed for everything instead of historic choices."***
>
> **Private sector, landowner**

A number of participants felt that when climate change is communicated without linking to local priorities and pressures, this contributes to a misunderstanding of what is really at stake. *"We are talking about saving the environment but that is not what it is. We are talking about saving humanity"* (Third sector, landowner). Further to this, one of the island-based land-owning trusts provided an example of how people on the islands can be perceived as not caring about climate change, but this is because the way climate change is communicated through the public bodies channels creates a sense of *"these smart people from the city know better."* (Third sector, landowner)

Some **sectoral membership organisations** representing landowners and managers, including farmers and foresters acknowledged the **need to upskill and build understanding of "what good looks like"** for a coherent climate change response within their communities of

practice. Adaptation was viewed as *"still under the radar from the farmers point of view"* (Private sector, membership body) – unless there have been direct impacts on operations, such as extreme weather events that required reactive adaptation. Sharing "*best practice [becomes] so valuable, where a farmer [for example] learns from what someone else has done"* (Public sector, landowner). Similarly in forestry the *"understanding [of climate change adaptation] within the industry […] is very variable from incredibly informed to thinking of […] what pays now"* (Public sector). Participants from the forestry sector have also acknowledged the challenge of upskilling the new forestry officers and equipping them to work with landowners and their agents.

A few of participants expressed that they feel there is **systemic oppression of the Gaelic culture in Scotland and dismissal of the local needs**, with this being reflected in the way climate action is carried out and perceived in the Highlands and the Islands. Whilst *dúthchas*, a Gaelic term used to describe the interconnectedness of people, land and culture, has the potential to inform a more holistic vision and approach to land use across Scotland, it has been described by the participants as missing from the policies (even place-specific ones, such as the **Place Principle**). Participants discussed not only the usage of specific Gaelic terms, but wider opportunities to build on indigenous environmental and land stewardship knowledge and frustrations with the land use and climate change planning and policy that have been described as "dismissive" of these.

Many participants expressed a view that compared to mitigation actions, there is a notable lack of **funding for adaptation actions**. Some participants from across sectors said that it was not necessarily a case of finding new public money to spend, but rather **aligning existing funding streams and redistributing them to support adaptation and resilience**. The majority of the third sector participants stressed the need for **more targeted, joined up support to build resilience locally**. Several participants highlighted the significant positive impact that targeted support has made on building local resilience, such as a *"household-level funding grant scheme run by three Local Authorities in the North of Scotland"* (Community sector, non-landowner). Similar sentiments were held by those from the farming and forestry sector, with a desire for more targeted support. This included setting up a capital grant scheme for infrastructure upgrades and adaptation manuals for the sector that would cover the entire process, *"from nursery, through to harvesting, through to end processor"* (Public sector).

> ***"I don't even know where to begin to get funding for adaptation"***
>
> **Third sector, landowner**

> ***"If your adaptation solution is 'plant more trees' there is funding. But if the answer is something more mundane – say fixing field drains, or something more complex, there is nothing."***
>
> **Third sector, landowner**

5.2 Perceptions of climate and land policies: intentions and on the ground effects

In each interview we touched upon the existing and emerging policies relevant to the land use decisions and climate change adaptation and discussed their effects on the ground, where they enable or prevent adaptation and long-term resilience. Most of the participants reflected on the significant role of climate and land policies in driving the current and future land use and climate-readiness in Scotland.

Several participants noted current **absence of any legal or policy requirements for landowners or managers to make land-use choices that enhance resilience or adaptation**. Different participants perceived this as either a positive or negative factor in relation to climate resilience. Some private sector representatives expressed concerns about formalising climate change requirements into law, fearing *"this might turn discussion into the lawyer's paradise"*. Some stated that compliance is the key mechanism by which businesses are guided by the public sector: *"We're not really doing much [on adaptation], we're not really led or […] guided by the government apart from the areas where there is compliance."* (Private sector, land manager). Those representing community land ownership, public and third sector organisations generally welcomed stricter enforcement of policies, saying this would put in place helpful accountability mechanisms.

> ***"The risk is always that anything that's voluntary will not happen when budgets are stretched."***
>
> **Third sector/Research, non-landowner**

> ***"[Climate policies] use words like "consider" and "should" instead of "must", so I can "consider" the impacts of climate change and I can make a decision [not based on it]."***
>
> **Public sector, non-landowner**

> ***If we framed climate change like pollution [...] we regulated it, we checked it, we told them what the minimum amount [of action] is... but if did treat climate change like pollution we'd be able to say to land managers, 'well if you want to carry on with the deer numbers that you have, that is nickering the peat so much it's liberating carbon, then you pay, mate!"***
>
> **Public sector, landowner**

Some participants expressed concerns around the **disproportionate bureaucratic burden** community landowners have to face when a requirement for "another Land Management Plan" comes through. Several echoed the sentiment that community land ownership in Scotland in heavily reliant on making extra demands on volunteer labour, even if this is well-meaning or aiming to introduce best-practice in land management it can have a negative effect: *"If another request for a plan comes my way, I don't even know, I would probably just cry."* (Third sector, land owner)

> ***"There's a discrepancy between flood risk assessment and what developers complete. We know no one is actually doing thorough checks of what developers are doing."***
>
> **Third sector, membership body**

Amongst those aware of climate change impacts and recent policy developments (on the forthcoming Agriculture, Land and Biodiversity Bills) many pointed out some major **misalignments that could perpetuate the existing dynamics** preventing adaptation and longer-term resilience. The four areas of policy conflict (driving climate change, land use and ownership agendas in different directions) that came up most frequently were:

- **The effects of the Net Zero policies and programmes for adaptation, resilience and community wealth building**
- **Post-CAP agriculture policy and climate change requirements**
- **Land Reform and climate action**
- **Existing land use and designation classifications**

We describe these in more detail on the following pages.

> ***"It's not just all about the money […] You put a lot of effort in incentives and people want the money, but […] there's also the potential in strengthening and toughening of regulation. Some things are just not good to be doing, and societally, you should stop them or there is already a regulation saying why you shouldn't be doing that and it should be enforced better."***
>
> **Third sector, landowner**

5.2.1 The effects of the Net Zero policies and programmes for adaptation, resilience and community wealth building

Whilst at the policy level Scottish Government is committed to ending Scotland's contribution to climate change as well as adapting to the current and future impacts of climate change, the majority of participants expressed **concerns about the predominant focus on mitigation and promotion of Net Zero policies** (referring to the **'Net Zero' by 2045**). A number of participants were concerned with some aspects of Net Zero policies impacts on land use (such as driving woodland planting) at the cost of other land use purposes, such as food production and biodiversity conservation. Others pointed out the dominant theme of emission reductions and carbon sequestration in climate change communication they receive from the government, concerned about the lack of attention that adaptation receives. Many recognised that emission reductions are urgent, but they felt the way that current policies and climate change are being promoted are not contributing to acting upon climate change holistically, , by for example driving up land prices, redistributing the burden of climate action across society without consideration of fairness or justice in the process or creating a misplaced sense of blame and responsibility. The examples included a critique of lack of adaptation in the **Forestry Grant Scheme** that promotes the creation of new woodlands. These have been described as creating various issues, from driving up land prices, to redistributing the burden of climate action across society without consideration of fairness or justice in the process, and creating a misplaced sense of blame and responsibility. Specifically, some woodland planting projects carried out under the banner of carbon sequestration have been pointed out as not considering current or future climate changes (both in terms of species selection as well as wider landscape considerations).

A number of participants pointed out **inconsistent stories in the way climate change is communicated** – on one hand a seemingly positive "Net Zero" story and on the other a narrative that *"irrespective of our mitigation efforts, we still need to adapt"* (Private sector, membership body). There was a confusion whether adaptation is inevitable or just *"a Plan B"*, *"something to do only do if we fail with reducing emissions."* (Private sector, membership body).

Several participants described **mass corporate woodland creation and rewilding projects** as *"the wild west"*, *"land grab through carbon credits"*, *"a rush of land banking"* and *"a goldrush for land with land seen as a commodity for money making"* with many echoing the sentiment of frustration with the pace of the land market and the inequalities such an approach sustains, despite the attempts to ensure community benefits from such investments. Interviewees from the public and third sector have expressed strong concerns that the rising land prices undermine the Scottish Government's objective to achieve a more diverse land ownership pattern and ensure Scotland is a sustainable and resilient country.

> ***"No one likes to be disliked [...] if you make clear who the sinners are and who are the angels and who are the saints, you know people tend to gravitate towards being a saint [...] I don't think there's much clarity on who is who at the moment"***
>
> **Private sector, land manager**

Participants presented several accounts of how **communities, including small and medium scale farmers are priced out of purchasing land**, when highlighting the different ways place-based improvements (including community wealth building, regeneration and adaptation and resilience) are limited by the rapid development of the land market (See **Scottish Land Commission's report**, 2023 for further insights on Scotland's rural land market). Those speaking on behalf of community organisations have expressed concern that the pace and the scale of the land market, fuelled by the woodland creation schemes, prevents local communities from effectively shaping local place-making.

Those speaking on behalf of forestry and farming sectors also shared concerns about the *"big push on the mitigation […]"*, that was described as *"taking eyes off managing existing woodlands"* (Third sector, membership body) and *"pushing farmers to be reliant on importing essential supplies instead of acquiring them locally"* (Private sector, Membership body).

"The focus of the Land Reform bill on Net Zero, for example, is quite worrying for a lot of people who see Net Zero as quite a reductive way of approaching nature and climate. It feels like "how do we mitigate and get to net zero as quickly as possible" and we've got these targets to hit regardless of what that means for the land, land prices and for farming and food security."

Private sector, membership body

"We need a really serious regulation of carbon credit schemes and tree planting for carbon sequestration is needed pretty urgently. I'm sure there are ways that could have some good effect. I'm not totally convinced by it, but as it stands currently, I think the effects are definitely negative."

Private sector, membership body

There has been a sense of misplaced blame attributed to the Net Zero targets, amongst those speaking in reference to crofters, tenant farmers, and medium scale agricultural operations. It is apparent that **climate change acts as a triggering concept for a broad range of land-based workers and businesses**. This challenges constructive communication between the public sector and membership organisations representing land-based businesses or communities of practice, because the starting point for conversation can often be already difficult or defensive. Participants described current climate change communication as driving a split that does not quite make sense on the ground, because **many people tend not to separate mitigation and adaptation**. This has been evident with those representing community land owners (discussing the pressures crofters face with moving away from diesel) as well as island communities where in some cases the ways Net Zero policies and new land use designations are perceived as *"an awful lot like Highland Clearances"* (Third sector, landowner) with restrictions intended to reduce emissions are imposed on the local communities who feel like they contributed least to causing climate change but put in the position of paying the cost.

> ***"When decisions are taken far away by people who think they know what's best for the land, the people living there suffer from it. If you say the word Highland Clearances to anybody in the [...], they will know what you mean. And they are very afraid that it's going to happen again because many of these big policies feel an awful lot like that – 'uh you can't farm anymore here, you can't fish anymore here, you can't do all these things because somebody in Edinburgh or in London has decided that you who have not been hurting the land for the past 10 000 years need to stop when they will not tell that to the big fishing companies and oil companies who have been destroying the land"***
>
> **Third sector, landowner**

Several participants, from across the spectrum of organisations which were interviewed, highlighted that to get maximum uptake of adaptation action, there is a need **to better tailor climate change communications to the local area and emphasise the benefits** that holistically designed adaptation on a landscape scale can deliver.

"Multiple benefits that's the real attraction and that's how we can make it [adaptation] happen. [Not choosing climate action which is] bad for one thing and good for another. I think a really good example is the river restoration that's taking place on the Dee and the Spey which sporting properties like because it's improving habitat for salmon which is a species in decline... The conservation element like it because it also provides habitat for lamprey and freshwater Pearl mussel and all of these species that are under threat. It provides mitigation against flood events. More resilient to the climate change events. So, there is a multiple win, win, win, win from the action and it's not saying you know the benefits of this outweigh the benefits of that. So, you have [all of the local] economies and the cultures that were traditionally built around salmon fishing, in fact, you're making them all more resilient to the future."

Public sector, landowner

Case Study

Farmer, representative of a farming membership organisation

The interview with a farmer who is also a representative of a farming membership organisation highlighted multiple concerns that farmers feel when it comes to climate change:

- The sense that farmers are being scapegoated as 'climate villains',
- Direct impacts to their livelihoods and the difficulty of planning what to plant, when to harvest, what to feed in an uncertain climate,
- **Transition risks as net zero legislation begins to take effect with a diverse range of unintended consequences for adaptation and resilience.**

An example of one such unintended consequence, relates to what is being observed with a range of by-products from whisky distilling which have traditionally been used for livestock feed. The first stage in the production of malt whisky involves the steeping of malted barley in hot water. The liquid is drained off to be fermented and distilled. The residue which remains is distillers malt draff. It is palatable to all types of ruminant stock. Distillers draff has used for feeding cattle and offers an excellent, local source of additional protein for animals grazing on poorer quality land (as is common in many upland areas within Scotland), that makes use of a local waste product and supports the local economy. Distillery by-products had been a surplus product in Scotland and the livestock sector had benefitted from lower feed prices. This has changed:

> ***"Because of the rush to reduce emissions, the big distilleries are installing anaerobic digesters and using what is a waste product from their process, to produce energy and cut their carbon footprint. You know from their business perspective it makes sense. But what happens to the farmers who don't have that for feed anymore?*** *They're being driven to import soya from goodness knows where and with a carbon footprint of goodness knows what. From our members there is a plea, for someone in government to look at the big picture. Did they work out whether the best thing to do [with the malt draff], was to put it in [a biofuel] digester, an incinerator or feed it to the cattle?"*

A comparison of historic trade estimates of the quantities of Scotch whisky distillery by-products used for animal feed in the UK1 indicates a 57% reduction in feed use of over the seven-year period from 2012 to 2019. An unintended consequence has been that Scottish farmers are becoming more reliant on international imports, outsourcing emissions and becoming more vulnerable to supply chain disruptions and commodity market price spikes which are likely to increase in frequency and severity as the climate changes. A trend that has the potential to negatively impact Scotland's food security and reduce national adaptive capacity.

Photo: Barrie Williams for ScotGov rural, via Flickr

5.2.2 Post-CAP agriculture policy and climate change requirements

Several participants referred to concerns over climate and agricultural objectives: *"I think government payments for farming and forestry must focus much more on the climate emergency […] why are we still paying farmers per head of cow when [livestock farming contributes to emitting greenhouse gases]"* (Third sector, membership body). Some third and public sector participants described agricultural policies and funding (referring to the current direct payments) as *"driving the wrong things"* in terms of adaptation and resilience by encouraging land-based businesses to "do more of the same" instead of considering how they might need to change to both reduce emissions and build their resilience.

> ***"With the updated Agriculture Bill […] the small-scale farmers are going to be left behind because in order to meet [Net Zero] targets, it makes more sense to have three large farms rather than 40 small farms […] all the funding is area-based […] so people with the most land get the most funding"***
>
> **Third sector, landowner**

The end of the Common Agricultural Policy (CAP) and a prolonged period of **post-CAP policy** development has been described as a continued source of concern by some participants from private and community sectors. One person said that "hiatus is causing real uncertainty for many different sectors", many of which have long term planning cycles and any pause in activity can lead to significant delays down the line. Practical examples of these challenges included delaying planting hedges (e.g. for flood protection) anticipating receiving subsidies for these if done a few years later.

> ***"Why is the government dragging its feet about changing the grant support scheme for farming and forestry? […] We don't know what's going to be around the corner, so we're just sitting on our hands a little bit."***
>
> **Third sector, membership body**

5.2.3 Land reform and climate action

Several participants reflected on the implications of the **forthcoming Land Reform Bill** for climate action. The confusion between adaptation and mitigation was evident with some participants speaking solely about the possible mitigation consequences. A few participants expressed a view that to deliver a large-scale transformation in land use to achieve Net Zero is easier with fewer landowners, which could mean easier and quicker negotiation and potentially more efficiency. However, these arguments were contested by the third, public sector and academic participants, pointing to examples of small-scale farmers and foresters currently adopting regenerative agriculture, land-based climate action and nature restoration. Some participants noted that the actions undertaken by small scale landholders can be more beneficial to local communities and environment and that this group has a vital role to play in demonstrating the innovative practices needed, which could encourage adoption by larger scale operations. There was a debate amongst some of the participants on how this argument may play out differently once adaptation and resilience are added into the mix, since there is no one large-scale solution for adaptation and place-based resilience.

5.2.4 Existing land use and designation classifications

Several participants involved in the day-to-day management of community land expressed frustrations with the **existing land use and designation classifications**. Statutory land use designations in their current form can be a limiting factor to adaptation and to broader environmental restoration because of their narrow focus: *"Land designations* (meaning existing nature protection designations and agricultural classifications) *are locking land into one state, this isn't realistic given the dynamic changes happening as the climate changes."* (Third sector, landowner). With several participants discussing the need to understand habitats in the changing climate, one has summed up the current state as trying to *"to preserve certain species in aspic come hell or high water"*, an ambition that in many instances will not be compatible with climate change (Bardey, 2020).

Case Study

John Brown, Chair, Falkland Flood Action Group

The work of Falkland Flood Action Group illustrates the role of communities in evidencing change and increasing local resilience through citizen science, technology and empowerment.

After serious flooding in 2008 affected many properties in the village, the Community Council set up a flood group, Falkland Flood Action Group, to increase the resilience of the village and to work with local landowners to reduce the risks of flooding in the future. Falkland Flood Action Group supports residents to install measures such as flood doors and air brick covers to help prevent houses from being flooded. They co-ordinate sandbag and flood gate deployment and monitor the level of the local watercourses.

One of the most important tools used by the villagers in Falkland is RiverTrack. RiverTrack is a river level monitoring system designed to provide local community flood alerting, giving people time to react and take preventative action. The installation of the system was supported by a small grant from Fife Council.

> ***"Last November, there I was on holiday - I was on the phone when I saw the RiverTrack alert [for home] go off. So, from Melrose, I was monitoring the height of the burn that's threatening the houses in our local area and I was able to phone locals and say 'go and put your flood barriers up. Keep an eye in the water'. [Despite being far away from the village] I was able to alert people to the fact that they were under threat and while some of them realised it themselves. Some of them didn't."***

This example is testament to the potential that exists to significantly improve outcomes when extreme weather events occur, by combining:

- Technology and citizen science,
- Modest seed-funding,
- Joined-up working between agencies, and
- An informed, educated community.

Photo: Falkland Flood Action Group

5.3 Decision-making, relationships and power dynamics

In each interview we unpacked what current decision-making looks like for adaptation and resilience looks like in a land use context, and what are the key relationships and power dynamics – both what this look like currently and what changes are required for the future.

We found a **limitation -and in some cases absence - of decision-making structures at appropriate scales**, especially for those representing landowning and non-landowning public bodies and community organisations. Either these do not exist specifically in a land context, or when they do they remain insufficient and do not create opportunities for joining up land reform, climate change, community wealth building and other agendas crucial for place-based resilience and adaptation. Many participants noted that land use decisions are made mostly within the specific landholdings such as enclosed farmland or a forestry area, nature reserve or a settlement, rather than at a landscape or regional scale. In contrast, climate impacts can more easily understood through the catchment or landscape scales, for example adapting to increasing flood risk.

> ***"The interest of nature as perceived by people who don't live with it may differ greatly from the interest of nature in reality."***
>
> **Third sector, landowner**

> ***"I think there's a complete lack of agency that most people who live in the countryside feel."***
>
> **Private sector, membership body**

A number of participants remarked on the ongoing attempts to create more **locally sensitive and empowering ways to make decisions about the future of places,** for example through the **Regional Land Use Partnerships pilots** (RLUPs). One of the examples referred to as being exemplary in bringing together various stakeholders that otherwise wouldn't otherwise come together was the **Climate Ready Ken** project, with adaptation being the central driver behind the project. Other given examples of such regional partnerships were not driven by adaptation or climate related aims, with access to land and halting biodiversity loss being the starting point for forming the partnerships. Those from the community and private sector organisations familiar with the RLUPs questioned the Scottish Government's commitment to investing into the future of these and expressed frustrations with the lack of local partnerships or bodies that could bring the climate change and land use agendas under one umbrella.

> ***"We need to totally reimagine local democracy. We need to give resources and tools to the councils and communities to facilitate local deliberation around what they want, what the future looks like, in a way that also enables flourishing environment."***
>
> **Third sector, non-landowner**

"It is very clear that communities are not involved in the flood risk management process enough because the decisions that are made are not nearly transparent enough [...] they are doing a lot of work but to communities it is not visible"

Third sector, membership body

"We have too much centralization. We should be pushing things down to the local levels, with money devolved, not only over planning and regulatory powers, but grant making powers to make things happen."

Public sector, landowner

Participants shared how the lack of appropriate decision-making structures manifests itself in different contexts. For example, for community groups the difficulty often comes when **raising issues directly with the landowners, managers or their agents** and therefore are dependent on their willingness to engage. This has been described as further compounded by a *"lack of mediating organisations"* or platforms that several community organisations participating in the interview have stressed. Several participants also expressed concerns that organisations that are currently set up to act as intermediaries in land use and ownership space are still closely affiliated with the Government and would not be engaging in case of a politically sensitive issue emerges.

Several interviews echo a sense expressed by one of the participants that *"historically choices about land management largely boiled down to matter of preference and choice of the landowner"* (Academic sector). Several participants from all three sectors reflected that changes in land use to benefit adaptation and resilience would require a significant **cultural shift**, aligned with the direction that the Land Bill sets out, where land is expected to be managed in a way that generates social and ecological benefits.

It was not just a lack of appropriate decision-making structures in general that was prominent in the interviews. Many participants from the most remote communities interviewed expressed frustration with the difficulty they see in meaningfully engaging with policymakers. The issues they raised included current and historic dismissal of Scottish indigenous knowledges, poor digital connectivity, and disproportionate bureaucracy. Each of these are **layers of systemic exclusion which result in a lack of access to power and ability to influence decision making.**

Raised by one of the participants and echoed across several interviews (with those based in rural Scotland), was the impact of internet and communications infrastructure on community resilience. The instance referred to described the importance of installing 4G and 5G masts onto several empty housing units on one of the island's community estates to attract families and permanent residents and allow for home working and accessing essential services online. This was not possible through the government funding they sought, perceived as using public money for the private benefit. The installation of the internet masts may seem like a private household issue in the urban area, but in the rural island setting it is a question of wider community resilience. The participants stressed the importance of seeing the relationships between community resilience, digital inclusivity and rural depopulation and ensure this understanding is reflected in the design of funding schemes.

In unpacking relationships, decision-making and power dynamics in adaptation and land use, a core part of each of the interview involved discussing whether or not the impacts of a changing climate play a role in land-use decisions and how this may change in the future. For most participants, making decisions and acting upon the current impacts of climate change or taking anticipatory action to adapt for the future is not a priority today.

The reasons for this differ: a representative of the farming membership organisations stated that *"everything else [other than adaptation] right now is more important"*, referring to the **rising costs of doing land-based business**. Whilst this was a singular statement, the sentiment echoes in many interviews. Several participants also spoke of **uncertainty** associated with spending money on "adaptation actions" when there is no guarantee an anticipatory investment would pay off in the future: *"How do you tell a farmer 'dig a bore hole' [to adapt to droughts] that will cost them many thousands of pounds from their own pocket, when they don't even know if they will need it or not in the nearest future?"* (Private sector, Membership body).

Other participants speaking on behalf of private estates reflected that they have either **not felt climate change impacts strongly enough for them to make any responsive changes**; or feel they have already addressed "low hanging fruits" such as expanding the water carrying capacity of the drainage system on the estate or focusing their efforts on mitigation. Some questioned the attribution of storms and other extreme weather events to climate change altogether. Most of those speaking on behalf of private estates stated that *"at the heart of the decision is economics, and what will deliver an economic return"* (Private sector, landowner) with this echoed by public sector participants acknowledging that *"many landowners, farming community and forestry in Scotland are financially driven."* (Public sector, non-landowner). A number of participants have also stated they work with neighbours during and in the aftermath of extreme weather events, however this has not been described in terms of adaptation or resilience.

For community groups we found different reasons for adaptation not being a priority. Several representatives stressed the severity of the cost-of-living crisis experienced in their communities. Climate change impacts have been described by several participants as a hypothetical future issue, in contrast with the "choice between heating and eating people face now and not in 10 years." (Third Sector, landowner). Across third sector participants the attention a holistic approach to land use, that prioritises both people's and ecological wellbeing have been stressed and adaptation in this context is described as one of the many issues to think about.

Further reflecting on the priorities and drivers for action, several participants spoke about the confusion when it comes to **who is responsible and who should be funded to carry out climate action generally and adaptation more specifically.**

Several participants spoke on the need for a wider transformation of the economy, stating what would help is *"a complete collapse and remaking of our entire economic system"* (Third sector, landowner) and reworking our "*distorted sense of what we depend on"* (Public Sector, non-landowner). These may seem like abstract issues for adaptation and land use; however it is important to understand the wider political climate in which the conversations on a need for adaptation are taking place.

"Yesterday I was looking at a national consultation ... I'm thinking if I as a staff member who has paid time for this and has a PhD level education, find it heavy and hard to navigate. I can't imagine what it would be like for people who haven't been academically trained to deal with bureaucracy like I have... Salmon farms, all of these big companies will have dedicated staff for it. But how many communities would be able to phrase what they want to say in it? I want to look at it as the Scottish Government not understanding how people work rather than on purpose, excluding people. There is ... this indirect pushing away of groups that are not as equipped to deal with the way the government manages things."

Third sector, landowner

With certain thinking [addressing adaptation] means build 20% higher, or 20% wider or whatever we need to do. But as soon as we leave that and talk about much more complex system change, it isn't obvious, who drives that? It's not obvious whose responsibility it is."

Third sector/Academia

"I've got very nice big ditches and ditches are brilliant at slowing down the speed of water, but those ditches overtime get filled up [...], every time it floods, but the cost of having to come and dredge those every single or every two or three months is too much for anybody to do. And how you manage that? How you look at the [...] practical infrastructure funding, is it the roads department? Is it the flooding department? Is it farmers responsibility? Whose responsibility is it?"

Private sector, membership body

"Every time the [...] road shuts, the Council just puts up a sign that the road is shut [...] but there's not much explanation that the reason this road is shutting all the time is because the water levels going up and the storms and surges are becoming stronger. It's just shocking. I don't know whose responsibility it is to shout about these things, but there's a lot of stuff going on that's been affected by climate change [but] we're not really telling people that it's climate change that's causing it, so it's hard. We're not doing anything about it [...] because it's just, what are we going to do about it? I can't go out and build another road and I certainly can't get the funding to do that."

Third sector, land manager

Case Study

Ranger, land-owning Community Trust

This example is from one of the largest community owned estates in Scotland. The area is sparsely populated. Gaelic is the first language of many inhabitants and is an integral part of the area's identity. People here, and in the community organisations which support them are struggling with the multiple immediate crises facing them today, including: depopulation; a lack of affordable housing; price inflation of food and energy; lack of well paid, secure year-round employment; and the high prices of imported goods and transportation, and language shift from Gaelic to English, which leads to the collapse of traditional Gaelic culture and way of life.

These pressures are like those being experienced in other parts of Scotland, but are compounded by the remoteness of the location, the fragility of underlying infrastructure, and the hardships brought by the existing climate. For many climate change action is, by necessity, a second-order priority:

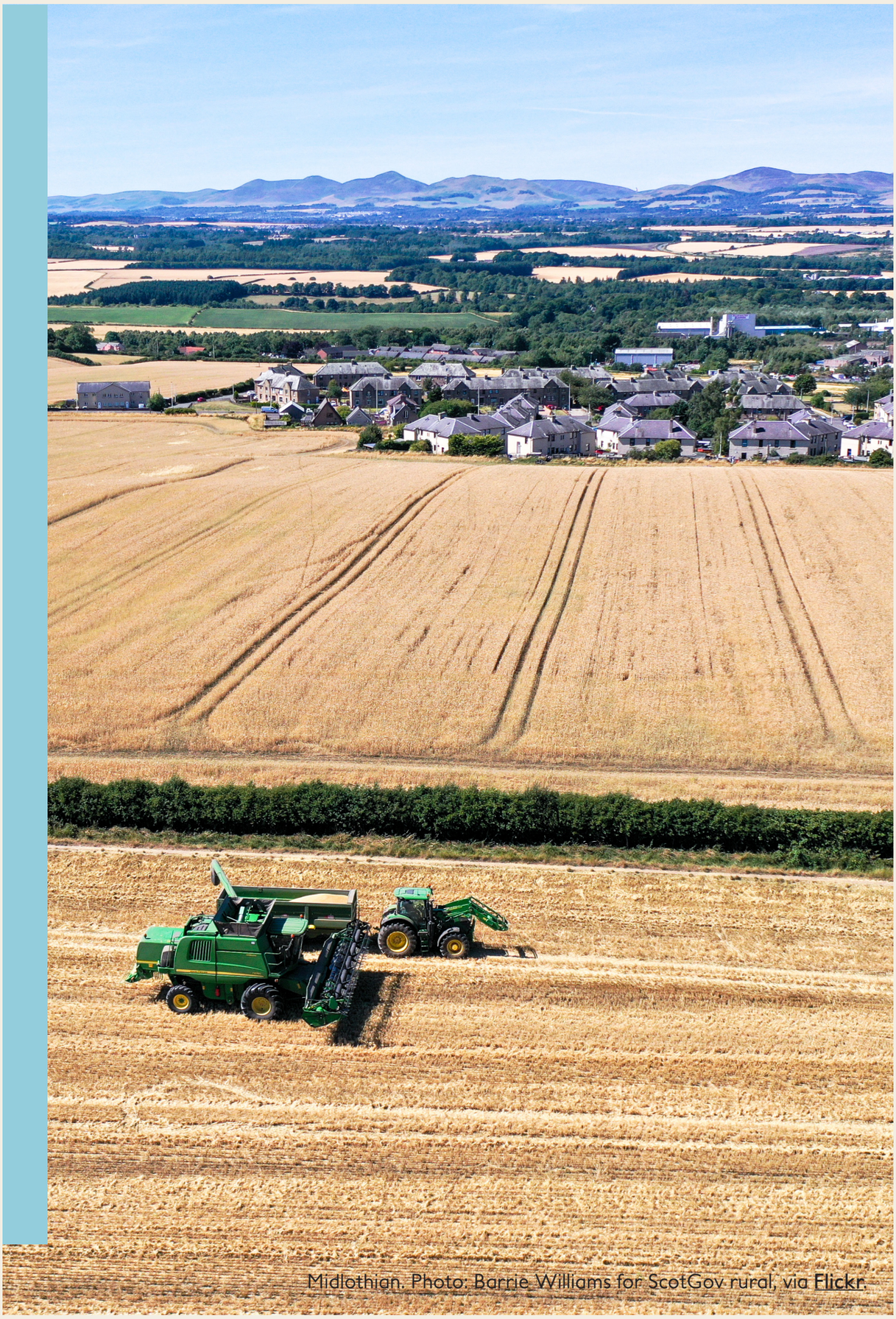
> *"Our community trust, like many other with small staff and budget, is struggling so much. We are dealing with other crisis such as poverty, fuel poverty, housing. Such serious economic issues [mean] that even for a ranger like myself, who should be involved way more with climate change action; there isn't such much time available for it."*

> *"Many of the effects of climate change are still theoretical for people. We know it's going to happen. BBut if you tell people: "in 10 years from now, this is going to happen here", they can't really listen when their worry is choosing between heating their house or eating. Because that's happening today."*

While increasing community ownership of land, or community decision-making can bring notable positives, it should be borne in mind that the places in Scotland which have had the most uptake of community ownership, are also the poorest places. Considerable external support is needed, even after community buy-outs have occurred to overcome systemic barriers and address the root causes of vulnerability which very often stem from poverty and lack of economic opportunities.

> *"Often behind the positive stories of communities taking ownership, there is the fact that communities don't have the means to develop what they need."*

St. Abbs. Photo: Kristin Snippe



Midlothian. Photo: Barrie Williams for ScotGov rural, via Flickr.

6. Discussion

In this section we consider what the interview findings mean for enhancing climate change adaptation and resilience in a land context. We also reflect on the limitations of our approach and unpack the third research question on the changes needed to embed adaptation in land-related decisions.

6.1 Building knowledge and skills to address adaptation

The public sector's high levels of **knowledge of the climate impacts, perceived need for adaptation and awareness of interdependencies** between land use choices and climate adaptation and resilience stands out compared to the private sector, and to a degree, the community sector. This may be at least partly a reflection of The Climate Change (Scotland) Act making climate adaptation a statutory requirement for all Scottish public bodies, with mandatory reporting of progress. The Act places duties on public bodies to report on their adaptation and mitigation and there is also additional support available, for example the Adaptation Scotland's programme focus on public sector and the Adaptation Capability Framework with an associated Benchmarking Working Group.

An important finding is that key government-affiliated climate change communication is not reaching widely across the land use sector: the detailed evidence of climate change impacts, including risks and opportunities in the UK CCRA3 reports is not visible, with this knowledge remaining within the institutions and networks of public-sector affiliated organisations involved in producing the reports. The confusion with Scotland's adaptation goals and approach is further complicated by **SCCAP2 not setting out sufficiently clearly what should Scotland be adapting to more specifically**, making it difficult to understand and imagine what is the appropriate scale and urgency of the adaptation efforts required.

Making the knowledge that we have about climate impacts (such as the UK Climate Change Risk Assessments) more accessible and widely communicated through membership bodies will be essential for linking up land use choices with climate change adaptation. One priority area is to improve s**tatutory advice on sustainable land use to include adaptation and resilience** that is given by the public bodies and local authorities. People in a position of power - in relation to advice or distribution of funding - who have little understanding of climate impacts may not understand the full effects of this on the decisions they make, and people and places affected by these. Embedding adaptation into membership and public body organisations could create ripple effects of adaptation knowledge spread across communities of practices and linked with organisations' core purposes. Given the range of sources that participants indicated they already use to understand climate change – including **peer-to-peer knowledge sharing and networking events**, conversations with colleagues, a combination of SEPA data with locally owned flood data, their own experience of working with the land, plus anecdotal evidence – it is essential that these kinds of practices are supported in future, especially with the membership organisations that tend to facilitate such spaces.

We found a notable lack of concrete examples of "best practice" adaptation in action widely accessible and available to people. Rather than the inclusion of adaptation into an action plan, or building a partnership to address adaptation, we heard about more day-to-day on the ground stories. Much of the international research focuses on adaptation in the Global South that is not immediately relevant to the Scottish context, whilst the industry reviews and reports provide more technical summaries of the current and future climate change. Building on Adaptation Scotland's library of case studies it is essential to add to and draw on numerous examples of what ClimateXChange terms "autonomous climate adaptation" (actions that may not be designed as "adaptation" but do contribute to adapting and building resilience) from across the participants. These included planting different types of trees on one of the community-owned estate on the islands, swapping the crops grown on a farm on the West coast, and upgrading the drainage system on one of the mixed-use estates in the Highlands. It has

been stressed by several membership organisations that **one good example of adaptation can kick-start a lot of adaptation projects across membership**, making it important to **gather, share and support best practice stories** via such channels.

In addition to calls for practical examples of adaptation, the need for knowing **what is to be protected and where** came through strongly in many interviews, which is resonant with ClimateAdapt's briefing on **Integration of climate change adaptation in land use planning**. It argues for the urgency to identify most vulnerable zones, alternative uses and spatially-based adaptation options together with residents, workers and those with key local knowledge. Building on existing local and regional climate vulnerability mappings (Dynamic Coast's **Map of coastal erosion disadvantage in Scotland**, Climate Ready Clyde's **Climate Vulnerability Map for Glasgow City Region**, Highland Adapts' **Climate Story Map** to capture lived experiences of climate change in the Highlands) can help **generate place-based understanding of climate vulnerabilities in Scotland** and guide Local Authorities and Scottish Government in funding allocations and designs of funding streams to support just and fair adaptation and resilience.

It is also essential to examine the **assumption that more knowledge and awareness of climate risks and impacts will lead to more adaptation and resilience** in the land context. Amongst those with intermediate to advanced levels of awareness (see **Adaptation Capability Framework**), the level of action or mainstreaming adaptation into decisions remains low. Within the private sector this has been illustrated by cases from the large private estates with mixed land use, who have implemented some of the easier and less costly adaptation actions, such as widening the pipes to help cope with more water flow, but largely perceiving that it makes more sense to make the changes as they are required instead of in an anticipatory manner. Underlying drivers of land use change (or changes made within land-based businesses or organisations), such as rising costs of fertilisers for farmers or financial incentive to plant trees instead of growing crops, cost of living crisis, rural depopulation, or the cost of processing particular types of timber play a major role in day-to-day choices and adaptation needs to be considered alongside these drivers.

6.2 More nuanced and targeted adaptation and resilience communications

There's a common story of a**daptation referred to as "the poor cousin" of mitigation or "the Cinderella" of the climate policy**, a sentiment resonant with the discussions in many interviews. These metaphors reflect a higher degree of political traction and funding associated with mitigation. As with "climate action funding" (such as direct funding support Woodland Creation Scheme and Peatland ACTION programme, or indirect via supporting the creation of the regional climate hubs via SCCAN) the main attention both in terms funding, but also communications and accompanying stories goes to mitigation and Net Zero agendas, driving misunderstanding about sensible choices when it comes to adaptation and land use. However, **there's a more complex story here than simply making adaptation receive the same extent of prominence as mitigation.**

The all-encompassing effect the "Net Zero" seems to have a strong role in shaping the **collective imaginary of the appropriate climate action**: on the receiving end of the "climate communications", as one participants pointed out is *"all we get is mitigation, mitigation, mitigation, […] but where is adaptation within it, where's looking at heat or flooding or requirements for droughts or changes needed at the landscape scale."* (Private sector, umbrella body). There's a sense of frustration amongst many participants (of which only few questioned the need to adapt in the first place) with the single-issued approach to climate policy, that **no holistic approach to tackling social and ecological crises**. In addition to this such skew towards mitigation drives a sense of **misplaced blame** amongst the participants and the communities they represent.

Case Study

Donald McPhillimy, Director, Reforesting Scotland, Third Sector

The need for a positive narrative and a clear vision for what 'good looks like' was heard in the majority of interviews. Many participants were alert to the importance of tailoring the narrative to address local concerns and priorities and to reflect local tradition and connection to the land. And many participants were able to express their ideas about what this vision could entail. A particularly eloquent example came from Reforesting Scotland:

> ***"What would good look like? Well, the easy answer is like parts of Norway. Basically, you would have more trees, more semi-natural habitat. You have more people doing more things, you have fewer sheep, fewer deer. You'd have fewer grouse and fewer pheasants, there may be about the same number of cattle. And there would still be sheep and there would still be deer. It's just the sheep need to be off the hill a bit, and the cattle would be mostly off the hill as well. And the hills - the higher parts need to be reforested and rewilded, to a large extent. And trees in the uplands which includes commercial forestry and non-commercial native woodland. We need a half wild mosaic of different land uses. You have a mosaic, and all the pieces interact with each other. So, there's lots of edge effects between them and a lot more rewilding and a lot more species. A species rich land."***

Diversifying patterns of land use in Scotland has the potential to offer significant benefits for climate change adaptation and other benefits for a diverse range of industries and population groups.

> ***"We think we've got a good tourist industry now coming to see the beauty of the Highlands. It'd be nothing compared to what it could be in the future. You know, so many more people want to come and see, not just Scotland's beautiful bone structure – the barren landscapes which is what we have now. But they would also want to see the maturing landscape, the process of that happening. Now that will get people really excited. You see it already in places like Glen Feshie and Marr Lodge, you know where the pines are coming up, and the whole of nature's coming back - that's what would really excite visitors. I think Scottish people, too, would enjoy and be able to take pride in their country, which for so long many of us feel has been mismanaged by a few for their own personal pleasure."***

Glen Feshie. Photo: Spike, via Wikimedia Commons.

If the policies are to prioritise those who are most vulnerable and with least capacity to adapt to the impacts of climate change, such as many of the island communities, care needs to be taken not to put pressure on them to bear the burden of mitigation. For adaptation action to be transformational and addressing underlying causes of climate vulnerability, it is essential go beyond levelling adaptation with mitigation to build strong alliances with the land reform agenda and its narrative – that there is more land being managed for more public good and communicating how adaptation and resilience can be an effective route for unlocking transformational change, and in that adaptation.

> ***"There's so much pressure on community landowners and none on the people where this pressure should be, that is causing the problem."***
>
> **Third sector, landowner**

Varied levels of action as well as differences in reasons for inaction suggest that a more targeted **approach to adaptation in land use and ownership context is needed**. Understanding of climate-related risks is not sufficient to motivate action for various reasons. Reaching out to industry umbrella and membership organisations to build a base level of literacy on climate change impacts, resilience and adaptation is an essential first step towards integrating climate resilience in day-to-day land use decisions. With the community sector, it is less about base levels of awareness but working with the umbrella and membership organisations to tackle the underlying social and economic issues that are an urgent priority and build adaptation and resilience into existing climate and social justice projects and approaches.

The discrepancy between understanding of climate change impacts and adaptation actions remains significant. With different drivers for inaction for businesses and private estates (not seeing strong enough need for anticipatory adaptation; expectation for adaptation to make 'business sense' and having no strong 'business case' for adaptation) and community land owning groups (dealing with underlying issues of poverty, public health challenges, quality of housing, availability of good and secure jobs, rural depopulation, etc. making adaptation not as urgent), it is useful to reflect on the **framing of adaptation**. Adaptation arguments as communicated through the Scottish Government channels and associated programs are reliant on imagining Scotland where people and organisations are supposed to on one hand be aware of what climate change risks are and on the other adapt to these risks by minimising them or taking them as opportunities. From the interviews, especially with the participants whose job posts did not include addressing climate change, it has been evident that risk-management framing is not resonant with people's lived experiences. Across the interviews there has been a sense that **there is more to life than risk management and an awkwardness in talking about climate change solely though risk/opportunities framing**. Whilst there is no clear-cut solution to what this means for working with communicating climate change and adaptation needs in Scotland, it is worth considering what alternative framings of regeneration, community wealth building, maintenance and repair can offer to reflect the more intricate reality of social action that is not confined to minimising risk.

Within the **farming** sector, targeted adaptation support might involve working closely with membership bodies (such as National Farmers Union Scotland, Scottish Tenant Farmers Association, Land Workers Alliance and others) to generate a conversation about specific climate change impacts. This can build on the work and resources from the **Farming for a Better Climate** and **Scotland's Farm Advisory Service**, tailoring the conversation advice to dairy, livestock, crop and other type of farming; creating opportunities for regional cooperation (building on e.g. Highland Adapts, Cairngorm Partnership); and exploring options for setting up an infrastructure capital grant scheme to support adaptation and resilience.

For **forestry**, targeted adaptation communication would rely upon working with membership bodies (such as Community Woodland Association), the public sector (such as Forestry Land Scotland and Scottish Forestry) and forestry estates and farms (such as members of the Scottish Land and Estates) to ensure the **Forestry Grant Scheme** and **Woodland Carbon Code** encourage embedding current and future climate impacts into the choice of trees for planting; bringing foresters together to understand the impacts for the industry from the nursery to harvesting, to processing stages, including the implications for contractors; and building skills amongst the new foresters.

For communication and enhancing adaptation within **estates with mixed land use** it will be essential for the Scottish Government to develop relationships with the members of Scottish Land and Estates that includes estates of various sizes and types; land agents, who play an important intermediary role between landowners and local communities; contractors and rural surveyors, businesses and communities, and tenants who live and work on the estates. It is essential to build a shared base level of awareness of current and future climate change impacts on the nature of life and work on the estates.

In enhancing adaptation within community land use and ownerships sector, it is also key to work with membership bodies (such as Development Trust Association Scotland, Community Land Scotland, Scottish Flood Forum and others) and relevant public bodies (e.g. SEPA) to ensure adequate support and high-quality guidance that embeds climate change adaptation as part of wider advice is available for communities who own land or are about to undergo a buy-out or asset transfer process (see **Community Ownership Support Service** (COSS) set up by the Scottish Government and delivered by DTAS); as well as working with the Regional Climate Hubs coordinators to ensure locally-responsive options for targeted household support, linking resilience, fuel-poverty, and digital connectivity. An example of bringing together climate impacts and immediate concerns is an **Outer Hebrides Climate Rationale** - it presents an overview of climate change and its impacts for the islands through the lens of livelihoods.

CCC's **Land use: Reducing emissions and preparing for climate change** report differentiates between low regret measures and planned transformation measures, discussing adaptation within crop and livestock production, flood management and forestry. Actions like improving water conservation measures, drainage systems and increasing a diversity of tree species have been reported as being done in a very minimal way. However, if seen alongside possible planned transformation measures, such as fundamentally changing agricultural production through new technologies, creation of silvopastures, and other mixed land use types, it may be more strategic to raise awareness of the transformational measures to unlock adaptation in land use.

6.3 Linking up policies to embed adaptation and resilience

Climate change adaptation and resilience is a complex, not widely understood subject across Scotland, and this is reflected in the interviews. The fracturing of the policy landscape into separate themes with topic-specific outcomes does not encourage mainstreaming and embedding of climate change action, and as a result there is no clear alignment on adaptation and resilience across all land and climate policy.

Climate and land policies are not the only driver in land use choices, but it is clear these are important, and the existing policy landscape includes a tapestry of different legislation that ranges from enhancing to preventing adaptation and resilience in Scotland. Given that there are several important pieces of legislation currently in development, it is crucial to ensure understanding of climate impacts and a robust response to them is embedded into any policy that will further drive land use choices, especially within **agriculture, biodiversity and land reform**. With the national level policy commitments to **Community Wealth Building**, implementing the **Place Principle** and **Just Transition**, there is a strong case to be made for adaptation and resilience being a public good, requiring more resources and policy support mobilised to deliver it.

Another important factor is the way participants have discussed the solutions for supporting more coherent climate action in Scotland that would include both adaptation and mitigation. **Some participants' stories remained largely within the market-based approaches** to the climate crisis, extending the logic of the Net Zero approach in Scotland (that attempts to make emissions reduction profitable without challenging the fundamental logic of economic growth). The arguments made within this vein include needing to *"make adaptation make business sense"* (Private Sector, membership body), *"reimbursing private sector where they are doing something for the good of resilient Scotland"* (Public sector, landowner) and framing adaptation through the cost/benefit and risk/economic opportunities lenses. Viewing land through this lens tends to be perceived primarily as a financial asset or a commodity to leverage for economic gains that may come with adaptation.

A contrasting view, expressed by several participants from both community and public sectors, **calls for a more transformational approach to climate action that includes adaptation and values land first and foremost for its life-supporting capacity**. The solutions through this lens go beyond the "market" concept and call to explore **land commoning** and economic redistribution through a more just tax system, as suggested by a few participants (pointing to further exploring Scottish Land Commission's **work on tax and land property**, Common Weal's **property tax policy proposals** and IPPR's **work on local tax powers in Scotland**). If adaptation in Scotland is to follow a more transformational pathway, it means exploring non-market-based approaches to climate change, as advocated by the grassroots organisations and movements.

Whilst some of the participants have been advocating for a slowing down of the land market in Scotland, primarily because of the impacts on community land ownership and Scotland's ability to tackle climate change, others have been focused on trying to minimise the negative effects the large-scale land buyouts have on local communities and land (Robbie and Jokubauskaite, 2022). There's a **short-term benefit to including the requirement to adapt in the Principles for Responsible Natural Capital and Carbon Management Protocol**, part of the suit of Land Rights and Responsibilities Protocols. However, in its current form it focuses on mitigation, again prioritising reducing emissions at the cost of adaptation.

Case Study | Food for Thought

There remains an ethical and practical question, raised by some of the participants and reflected in the media narratives of climate change and land use: to what extend market-based approach to climate change can deliver a **just transition** towards a fairer, greener future for all and what are the lessons for adaptation?

Interview insights and reflections:
Several participants representing private and public sectors noted that to address climate change and resilience, there needs to be a financial incentive: *"adaptation needs to make business sense"* (Private sector, umbrella body). The consideration of financial driver in business decisions is reflected in the Scottish Government's approach to climate policy. In response to this there's ongoing work to demonstrate the adaptation revenue streams opportunities and proposals for public sector to maximise private sector funding of nature-based solutions (Frontier Economics & Paul Watkiss Associates, 2022), alongside efforts to ensure natural capital contributes to the just transition and investment benefits are distributed equitably (Scottish Land Commission). However, several participants critiqued this approach, pointing out that solutions that emerge from this thinking remain within the market-driven thinking and cannot address the fundamental challenges of just transition and deliver equitable outcomes. This reflects a difference in worldviews and whilst can't be resolved with this research, needs to be considered in how adaptation is planned, communicated, funded and implemented.

Edinburgh. Photo: Reiseuhu

6.4 Understanding power and building relationships to advance adaptation and resilience

The findings related to knowledge, skills, resources and policies to support climate change adaptation, discussed in the previous subsections **6.1**, **6.2** and **6.3** are broadly coherent with the messaging of the leading reports, such as the CCC briefings and reviews. However, one major divergence between the industry reports and the participants' insights was the emphasis placed on power relations within land and climate policies, their communications and enforcement. The industry reports stress the technical nature of addressing climate change in a land use context, however in the interviews, the key themes on this included addressing underlying issues of who decides on the future land use and how communities can meaningfully shape these choices, unpacking historical inequalities in the process.

Understanding the power dynamics in land use, especially in the Scottish indigenous, rural and island-based communities should be the core of climate policy. One avenue for building a more holistic and fair approach to addressing climate change in Scotland is working with the existing indigenous knowledges and skills. In the Gàidhealtachd of the Highlands and Islands **there are several traditional concepts which offer positive holistic framings for communicating effectively on climate change issues and which could offer useful scaffolding for building and delivering policy in an effective way**, and in a way which resonates with local people:

Dúthchas

The concept of the connectedness and inter-relationships between land, people and culture. This Gaelic concept cannot be directly translated into English. At its heart is the idea of unity existing between land, people, all living creatures, nature and culture. The term summarises local conceptualisations and understanding of specific habitats, hyper-local knowledge, sustainable practices and agricultural history – essentially how to live well, but live lightly in a certain place.

Buntanas

Expresses the concepts of people having a deep association with a specific area of land, a communal sense of embeddedness and rootedness through family lineage and history of a community who belong to and care about a certain place.

Cianalas

A deep-seated sense of belonging to place where your roots lie.

These are a small number of many Scottish indigenous concepts which could inform a holistic approach to how the future of land use and climate change are understood in Scotland. However, these concepts are currently not seen in policy. Other than preserving intangible heritage perspectives, the concepts have real potential to inform policy and practice with a more meaningful connection to the land. Gaelic concepts such as *buntanas, cianalas* and *dúthchas* could bring to life real resonance with climate change issues within some parts of Scotland where the connection to land runs deeper than only viewing the land as a resource.

Further to this, **seeing climate change adaptation in historic context of land use decisions in Scotland** is essential for addressing some of the root causes of climate vulnerability. The fact that a few participants speaking on behalf of land-owning community groups described the current implementation of climate change policies as "the new Highland Clearances" is a strong statement, but it needs to be

understood in the wider history of the Scottish Highlands (see Urquhart 2023). Recent industry reports (**Scottish Land Commission, 2019**) demonstrate the current concentration of land ownership in Scotland is causes "serious and long-term harm to the communities affected, including decreasing community resilience. This makes land use decisions, including adaptation, extremely sensitive as they can reinforce historic injustices. Robust community participation processes in these decisions, rooted in the historic understanding is essential for developing place-based and history-sensitive adaptation solutions. It would also be beneficial to draw stronger connections between the benefits of a more distributed land ownership (see Community Land Scotland's **research** on how community land owners contribute to holistic climate change action and adaptation) and place-based action, including adaptation. The evidence to support this includes the experience in setting up and running community land buy outs in the Scottish Borders (Tarras Valley Nature Reserve), Outer Hebrides (North Harris Development Trust) and other members of Community Land Scotland as well as recent climate resilience research (see Danson and Burnett, 2021).

Frequent references to the more widely available funding for mitigation and carbon sequestration compared to the lack of funding for adaptation and resilience are important to see in the wider context of funding to support land use changes and how they redress or reinforce existing inequalities and power imbalances. When the community groups and local authority areas that have the experience of being systematically underfunded are asked (or prompted to via the current Net Zero policies and approaches) to focus on "reducing their contribution to climate change", this risks continuing driving the unfair burden that is placed on already vulnerable and deprived communities and places, instead of supporting them to adapt. **Targeted funding support**, such as household grants, long term support to community groups via resourcing local councils and devolving the grant-making powers, support for community-led data gathering, sector-specific support, like infrastructure funding for crofters and farmers, catchment-scale funding for NFM all can be instrumental in providing real adaptation and resilience support to people and places who need it most in Scotland. With much climate change mitigation funding focussed on creation of new woodland or peatland restoration, **it is vital that adaptation policy makes the case for maintenance funding**. This means funding for maintenance of existing woodlands, peatlands once they are restored, drains and other infrastructure. With a number of participants indicating they already work with others in their communities in an event of an emergency, itis important that these practices are supported. Framing support for these through the lens of responsive and anticipatory adaptation may help strengthen the connection between existing activities and climate action.

Finally, climate change impacts already are and will be felt across all of society, but different parts of society and ecosystems will experience them differently. CCC's report on **Just Transition and Climate Change Adaptation** points to **land-use as one of the particularly relevant areas for unpacking the climate impacts in relation to those who are most exposed, most vulnerable and have least adaptive capacity**, such as households with lower incomes, ethnic minorities, the elderly, those with limited mobility and ill-health as well as rural and coastal populations. Vulnerable groups also include tenants, both within privately owned housing as well as farming tenants on privately or publicly owned estates. The nature and security of these tenancies determines how tenants see long-term planning for the place or land and needs to be seen in close connection to the efforts to build resilience. One example for action would be to focus on developing climate adaptation approaches with the Crown Estate Scotland who own and manage 37,000 hectares of land that includes rural and coastal land with 2,000 tenants, making any actions taken here potentially very significant. Linking up this existing knowledge on who is most vulnerable to climate change with building base levels of awareness of climate impacts is essential for fostering adaptation effort. Whilst there remains a gap between the knowledge that is produced within CCC reports and on the ground experience and awareness, making progress on adaptation will continue to be difficult and may result in potential negative consequence where any adaptation actions could increase risks elsewhere.

7. Next steps

This report has been developed to inform discussion within Scottish Government and ultimately a wider audience. Sniffer, as the authors and as part of delivering the Adaptation Scotland Programme, would be pleased to continue the conversation with participants of this research, the Scottish Government and other stakeholders to work towards enhancing climate change adaptation and resilience in land use and ownership context in Scotland.

If you have any questions about this report or would like to collaborate on developing this work further, please get in touch with us via info@sniffer.org.uk.

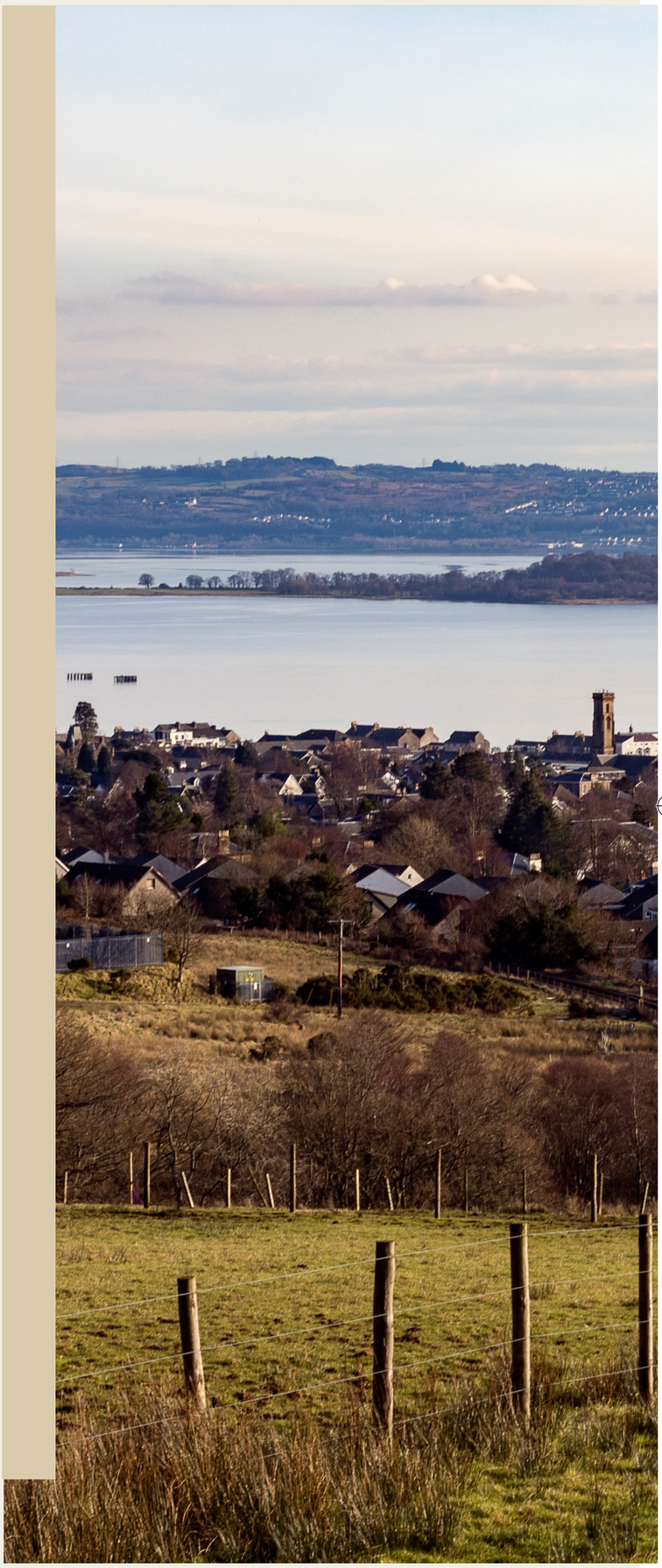



Photo: Gary Ellis

References

Bardey, D., 2020: Critically Evaluating the Consequences of a Single Species Conservation Approach. JOJ Wildlife and Biodiversity. 2(1): 555579. juniperpublishers.com/jojwb/pdf/JOJWB.MS.ID.555579.pdf

Betts, R.A. and Brown, K., 2021: Introduction. In: The Third UK Climate Change Risk Assessment Technical Report [Betts, R.A., Haward, A.B. and Pearson, K.V.(eds.)]. Prepared for the Climate Change Committee, London www.ukclimaterisk.org/independent-assessment-ccra3/technical-report/

Casey, J., 2023: Climate Adaptation Finance: Strategic Priorities and Actions for Scotland. Produced via the Adaptation Scotland Programme.

Climate Change Committee (CCC), 2021: Is Scotland climate ready? – 2022 Report to Scottish Parliament. www.theccc.org.uk/publication/is-scotland-climate-ready-2022-report-to-scottish-parliament/

Climate Change Committee (CCC), 2018: Land use: Reducing emissions and preparing for climate change. www.theccc.org.uk/publication/land-use-reducing-emissions-and-preparing-for-climate-change/

Climate Change Committee (CCC), 2021: Agriculture and Food Briefing. In UK Climate Change Risk Assessment (CCRA3). www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Briefing-Agriculture-and-Food.pdf

Climate Change Committee (CCC), 2021: Land Use, Land-use Change and Forestry Briefing. In UK Climate Change Risk Assessment (CCRA3). www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Briefing-Land-Use.pdf

Climate Change Committee (CCC), 2022: The Just Transition and Climate Change Adaptation www.theccc.org.uk/wp-content/uploads/2022/03/CCC-The-just-transition-and-climate-change-adaptation.pdf

Climate-ADAPT, 2023: Integration of climate change adaptation in land use planning. climate-adapt.eea.europa.eu/en/metadata/adaptation-options/adaptation-of-integrated-land-use-planning

ClimateXChange, 2014: Land estates in Scotland: Perceptions of climate change and climate policy Implications for future policy support. www.climatexchange.org.uk/research/projects/land-estates-in-scotland-perceptions-of-climate-change-and-climate-policy-implications-for-future-policy-support/

Common Weal, 2021: A Property Tax for Scotland. commonweal.scot/policies/a-property-tax-for-scotland/

Community Land Scotland, 2023: Community Land Owners and the Climate Emergency www.communitylandscotland.org.uk/?resources=community-landowners-and-theclimate-emergency

Danson, M., and Burnett, K., 2021: Current Scottish Land Reform and Reclaiming the Commons: Building Community Resilience. Progress in Development Studies, 21(3), 280–297. journals.sagepub.com/doi/full/10.1177/14649934211018393

Development Trusts Association Scotland, 2023: Community Ownership Support Service (COSS) dtascommunityownership.org.uk/

Dunkley, R., et. Al., 2021: Dynamic Coast: Mapping Coastal Erosion Disadvantage in Scotland. CRW2017_08. Scotland's Centre of Expertise for Waters (CREW). Available online at: crew.ac.uk/publications

Elias, M., et.al., (2021): Restoration for whom, by whom? A feminist political ecology of restoration. Ecological Restoration 39(1-2): 3-15. doi.org/10.3368/er.39.1-2.3

Farming for a Better Climate (FFBC), 2023: Adapting to Climate Change resources. www.farmingforabetterclimate.org/resources/tags/?key=climate-change

Fawcett, J., and Gunson, R., 2019: Thinking bigger on tax in Scotland: Using Scotland's local tax powers to their full potential, IPPR. www.ippr.org/research/publications/thinking-bigger-on-tax-in-scotland

Ffoulkes, C., et.al., 2023: Research to update indicators which monitor progress in adaptation in England. ADAS report commissioned by the Climate Change Committee. www.theccc.org.uk/publication/research-to-update-indicators-which-monitor-progress-in-adaptation-in-england-adas/

Frontier Economics & Paul Watkiss Associates, 2022: Barriers to financing adaptation actions in the UK. A report commissioned by the Climate Change Committee. www.theccc.org.uk/publication/barriers-to-financing-adaptation-actions-in-the-uk-frontier-economics-paul-watkiss-associates/

Highland Adapts, 2023: Climate Story Map. highlandadapts.commonplace.is/

Intergovernmental Panel on Climate Change (IPCC), 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. www.ipcc.ch/assessment-report/ar6/

Lowe, D., et.al., 2013: Factors Increasing Vulnerability to Health Effects before, during and after Floods. International Journal of Environmental Research and Public Health. (12):7015-67. DOI: 10.3390/ijerph10127015

Marshall, A., 2022: Who Owns Scotland? The Rise of the Green Lairds. The Reuters. www.reuters.com/investigates/special-report/scotland-environment-green-lairds/#:~:text=The%20UK's%20largest%20private%20landowner,and%20221%2C000%20acres%20of%20Scotland

NatureScot, 2022: Biodiversity strategy to 2045: tackling the nature emergency. www.nature.scot/scotlands-biodiversity-strategy-2022-2045

New Economic Foundation, Common Weal, 2021: Our Land. A vision for land reform in Scotland and how we get there. A report commissioned by REVIVE. commonweal.scot/wp-content/uploads/2021/05/OUR-LAND-a-vision-for-land-reform-and-how-we-get-there.pdf

O'Brien, K., 2012: Global environmental change II: From adaptation to deliberate transformation. Progress in Human Geography, 36(5), 667–676. doi.org/10.1177/0309132511425767

Outer Hebrides Community Planning Partnership, 2022: Outer Hebrides Climate Rationale. An overview of our changing climate and impacts for the islands. www.cne-siar.gov.uk/strategy-performance-and-research/climate-change/outer-hebrides-community-planning-partnership/#:~:text=Climate%20Change%20Working%20Group&text=The%20group%20has%20broad%20representation,OHCPP%2-0Local%20Outcome%20Improvement%20Plan

Peskett, L., 2021: Land use partnerships for addressing climate change: What are they, why use them, and how do they work? Edinburgh Research Archive. era.ed.ac.uk/handle/1842/38139

Pound, D. et.al., 2016: Engaging and Empowering Communities and Stakeholders in rural land use and land management in Scotland. A report commissioned by the Scottish Government. www.gov.scot/publications/engaging-empowering-communities-stakeholders-rural-land-use-land-management-scotland/documents/

Reed, J., et.al, 2015: What are 'Integrated Landscape Approaches' and how effectively have they been implemented in the tropics: a systematic map protocol. Environ Evid 4, 2. doi.org/10.1186/2047-2382-4-2

Robbie, J. and Jokubauskaite, G., 2022: Carbon Markets, Public Interest and Landownership in Scotland. A discussion paper commissioned by the Scottish Land Commission. www.landcommission.gov.scot/downloads/628dea082d087_Land%20Lines%20Nat%20Cap-Carbon%20Markets,%20Public%20Interest%20and%20Landownership%20in%20Scotland.pdf

Scotland's Farm Advisory Service (FAS), 2023: Helping Farmers Adapt to Climate Change. www.fas.scot/environment/climate-change/adapting-to-climate-change/

Scottish Forestry, 2019: The Woodland Carbon Code. woodlandcarboncode.org.uk/

Scottish Government, 2019: Net Zero Scotland. www.netzeronation.scot/

Scottish Government, Agriculture and Rural Economy Directorate, 2021: Land use - getting the best from our land: strategy 2021 to 2026. www.gov.scot/publications/scotlands-third-land-use-strategy-2021-2026-getting-best-land/documents/

Scottish Government, Agriculture and Rural Economy Directorate, 2022: Land reform in a Net Zero Nation: consultation paper. www.gov.scot/publications/land-reform-net-zero-nation-consultation-paper/

Scottish Government, Agriculture and Rural Economy Directorate, 2022: Regional Land Use Partnerships: phase 1 process evaluation - final report. www.gov.scot/publications/regional-land-use-partnerships-phase-1-process-evaluation-final-report/pages/6/

Scottish Government, Agriculture and Rural Economy Directorate, 2022: Scottish Land Rights and Responsibilities Statement 2022. www.gov.scot/publications/scottish-land-rights-responsibilities-statement-2022/documents/

Scottish Government, Building, planning and design, 2019: Place Principle. www.gov.scot/publications/place-principle-introduction/

Scottish Government, Economic Development Directorate: Community Wealth Building. www.gov.scot/policies/cities-regions/community-wealth-building/

Scottish Government, Economy, Environment and climate change, 2022: Interim Principles for Responsible Investment in Natural Capital. www.gov.scot/publications/interim-principles-for-responsible-investment-in-natural-capital/

Scottish Government, Energy and Climate Change Directorate, 2019: Climate Ready Scotland: climate change adaptation programme 2019-2024. www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024/

Scottish Government, Energy and Climate Change Directorate: Just Transition. www.gov.scot/policies/climate-change/just-transition/

Scottish Government, Environment and Forestry Directorate, 2018: Engaging communities in decisions relating to land: guidance. www.gov.scot/publications/guidance-engaging-communities-decisions-relating-land/pages/4/

Scottish Government, Local Government and Housing Directorate, 2023: National Planning Framework 4. www.gov.scot/publications/national-planning-framework-4/

Scottish Government, Rural Payments and Inspections Division, 2019: Forestry Grant Scheme. www.ruralpayments.org/topics/all-schemes/forestry-grant-scheme/

Scottish Government, Rural Payments and Inspections Division, 2023: Agricultural Reform Route Map. www.ruralpayments.org/topics/agricultural-reform-programme/arp-route-map/

Scottish Land Commission, 2019: Investigation into the issues associated with Large Scale and Concentrated Land Ownership in Scotland. www.landcommission.gov.scot/news-events/blog/addressing-scotlands-pattern-of-land-ownership-can-unlock-economic-and-community-opportunities

Scottish Land Commission, 2023: Community benefits from investment in natural capital. A discussion paper. www.landcommission.gov.scot/downloads/63eb8fd87d297_Community%20Benefit%20Discussion%20Paper.pdf

Scottish Land Commission, 2023: Community Engagement in Decisions Relating to Land. Route Map. www.landcommission.gov.scot/downloads/5ddfaf5834ff3_GOODPRACTICE-routemap-web.pdf

Scottish Land Commission, 2023: Responsible Natural Capital and Carbon Management Protocol. www.landcommission.gov.scot/our-work/good-practice/responsible-natural-capital-and-carbon-management

Scottish Land Commission, 2023: Scotland's Rural Land Market Review of 2022 Insights. www.landcommission.gov.scot/downloads/646b052f67ad2_Summary%20of%20Rural%20Land%20Markets%20Insights%20report%202023.pdf

Scottish Land Commission: Tax on Land and Property. www.landcommission.gov.scot/our-work/tax-fiscal/tax-on-land-and-property

Sniffer, 2016: Climate Ready Places. Produced via the Adaptation Scotland Programme. www.adaptationscotland.org.uk/how-adapt/tools-and-resources/climate-ready-places

Sniffer, 2019: Scotland Adapts: A Capability Framework for a Climate Ready Public Sector. Produced via the Adaptation Scotland Programme. www.adaptationscotland.org.uk/how-adapt/tools-and-resources/capability-framework-climate-ready-public-sector

Sniffer, 2021: Climate Projections Summary for Scotland. Produced via the Adaptation Scotland Programme. www.adaptationscotland.org.uk/why-adapt/climate-trends-and-projections

Sniffer, 2021: Third UK Climate Change Risk Assessment Technical Report: Summary for Scotland, www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-Scotland-Summary-Final-1.pdf

Sniffer, 2022: Climate Ready Ken: what happens when a Community Development Trust initiates local efforts on climate resilience. Produced via the Adaptation Scotland Programme. www.adaptationscotland.org.uk/how-adapt/case-studies/climate-ready-ken-what-happens-when-community-development-tr

Sniffer, 2023: Glasgow City Region Climate Vulnerability Map. Produced via Climate Ready Clyde. climatereadyclyde.org.uk/climate-vulnerability-map/

Sovacool, B. et. al., 2015: The political economy of climate adaptation. Nature Climate Change volume 5, pp. 616–618. www.nature.com/articles/nclimate2665

Urquhart, H., 2023: Green lairds, rewilding and claims to land: the significance of symbolic masculinities to land reform. British International Studies Association

UKCEH Land Cover Maps, 2020. www.ceh.ac.uk/data/ukceh-land-cover-maps

Walker, G., Burningham, K., 2011: Flood risk, vulnerability and environmental justice: Evidence and evaluation of inequality in a UK context. Critical Social Policy, 31(2), 216–240. doi.org/10.1177/0261018310396149

Wightman, A., 2004: Common Land in Scotland. A Brief Overview. International Institute for Environment and Development (IIED) www.iied.org/9303iied

Annex 1
A list of participating organisations

Representatives from the following organisations kindly gave their time and expertise to assist with this project by undertaking a research interview:

- Annadale Estates
- Atholl Estates
- Cairngorm National Park Authority
- ClimateXChange
- Common Weal
- Community Land Outer Hebrides
- Community Land Scotland
- Community Woodlands Association
- Crown Estates Scotland
- Development Trusts Association Scotland
- Dormont Estate
- Falkland Flood Action Group
- Forestry and Land Scotland
- Highlands Rewilding
- James Hutton Institute
- Land Justice Network
- Landworkers Alliance
- Langholm Initiative / Tarras Valley Natural Reserve
- Loch Lomond & The Trossachs National Park Authority
- Moray Estates
- National Farmers Union Scotland
- National Trust for Scotland
- NatureScot
- Pairc Trust
- Reforesting Scotland
- RSPB
- Scottish Communities Climate Action Network
- Scottish Crofting Federation
- Scottish Environment LINK
- Scottish Flood Forum
- Scottish Forestry
- Scottish Government (Land Reform and Climate Change policy areas)
- Scottish Land Commission
- Scottish Tenant Farmers Association
- Scottish Land and Estates
- Social Enterprise Academy
- The North Harris Trust
- The University of Glasgow

Annex 2
Semi-structured interview guide

The following is a semi-structured interview guide we used for the interviews. The exact selection of the question followed from participants sectors and spheres of knowledge and skills.

Concepts and practices

How do you understand current **relationship between land management and ownership & climate change** in Scotland?

- Have you observed any climate change impacts and has this affected how you manage/steward the land?
- How do you understand relationship between climate change adaptation and mitigation in the context of land ownership and management?
- How are land use decisions made? What influences these decisions? To what extend considering current and future climate comes into the decisions?
- How far into the future do you plan? How do you feel about creating sustainable long-term plans for the land?

Partnerships and relationships

What are relationships like between neighbouring landowners/those affected by decisions made about land but do not own/ manage any?

- How do you work with others during periods of extreme weather?
- Is there any discussion/collaboration between landowners – such as in a catchment - to look at environment or social issues together?
- What are the biggest issues which cause conflict between in land use?
- What is your role in enabling communities to increase resilience? How might that role change in future?
- What range of partners would you need to work with in order to address climate resilience?

Looking into the future

- What would 'good' look like when it comes to *land ownership/management and climate change action, incl. adaptation?* What prevents it now?
- Who else in your opinion we should be talking about this with?

Adaptation Scotland

supporting climate change resilience

sniffer
knowledge brokers
for a resilient Scotland