



The just transition and climate change adaptation

March 2022

Summary and key messages

This report provides advice on the linkages between climate adaptation and a just transition.

The Scottish Government commissioned the Committee to provide advice on “the role of adaptation in a Just Transition” alongside its first independent assessment of the second Scottish Climate Change Adaptation Programme (SCCAP2). This briefing considers how adaptation to a changing climate links to the broader concept of a ‘just transition’ and how the distributional consequences of both climate impacts and adaptation actions can be addressed as part of policy making.

The key messages from this briefing are:

- **Fairness in adaptation is strongly linked to the concept of a just transition.** Just transition is currently a concept more commonly used in relation to reducing greenhouse gas emissions in a fair way. However, these considerations of sharing the effort to tackle climate change across society are equally applicable to efforts to adapt to the climate conditions expected in the future.
- **Climate impacts and adaptation actions will both have unequal effects.** For many climate impacts it is the most vulnerable in society that will be most impacted and have the least ability to adapt. Adaptation actions to address these risks will also have unequal impacts themselves. These may be different to those arising from the climate risks that they are seeking to avoid. There is potential for some adaptation actions to have unintended negative effects, increasing exposure of others to climate risks.
- **Effective and fair adaptation requires distributional effects to be considered throughout the policy cycle.** Throughout policy design, implementation and evaluation stages it is necessary to consider fairness and inequalities to ensure that adaptation policy is consistent with a just transition to a well-adapted society. Extensive and regular engagement with all affected stakeholders through the policy cycle needs to be at the heart of this. There are opportunities to extend Scotland's leading position in considering justice implications of climate policy, such as the Just Transition Commission, to also include adaptation.

This chapter is set out in four sections:

1. Defining a just transition
2. Distributional effects of climate change and adaptation
3. Developing just climate adaptation policies
4. Recommendations for Scotland

1. Defining a just transition

This section introduces the concept of just transition, how we interpret it within the context of climate change adaptation and highlights the relevant commitments to a just transition that have already been made.

We consider the just transition in tackling the distributional consequences of climate change and adaptation actions.

For this report we interpret the phrase 'just transition' to refer to the distributional consequences of both climate impacts and adaptation measures to address them.

- There are a range of definitions for a just transition within the environmental and climate change literatures with no universally agreed definition (Box 1).
- The definition that we use incorporates considerations of fairness in transitioning to a society that is resilient to current and future climate and weather conditions.
- The distributional impacts of the transition to Net Zero greenhouse gas emissions are not considered as part of this report, except where there are strong interactions with efforts to improve resilience to climate impacts (Box 2).

Box 1

Defining a just transition

The concept of a just transition has evolved and broadened over time and has now become a well-established part of discussions on how to tackle the challenges of climate change:

- The concept of a just transition originated in labour movements which campaigned for a programme of support for workers to transition away from jobs in environmentally hazardous industries.
- It has since expanded, in the context of climate change, to cover the idea that communities whose lives and livelihoods are expected to be particularly impacted by efforts to reduce emissions (e.g. workers in fossil fuel extraction industries) should be supported to ensure that their employment prospects are not abruptly curtailed and to find alternative employment.
- Other uses have extended this concept further, including ideas that a just transition towards a lower carbon economy should also address wider current inequalities and injustices across society, closely linked to the environmental justice movement.
- Although commonly used in the context of a transition to a low or zero carbon economy, 'just transition' is also aligned with the concept of 'climate justice' which considers how climate impacts (and adaptation actions to try and address them) affect people differently, with poor and marginalised people (across countries and within countries) often the most affected by climate and weather impacts.

Within Scotland, the Just Transition Commission provides a working definition of a just transition process as "Governments design policies in a way that ensures the benefits of climate change action are shared widely, while the costs do not unfairly burden those least able to pay, or whose livelihoods are directly or indirectly at risk as the economy shifts and changes". This definition recognises the principles of sharing benefits and burdens fairly to avoid future injustice and inequality due to an economic transition and could also be extended to considering climate impacts and the effects of adaptation interventions.

We adopt this same definition, for the purposes of this report, extended to climate impacts and adaptation interventions.

Source: Pinker, A. (2020) [Just Transitions: a comparative perspective. Report prepared for the Just Transition Commission](#); Farrell, C. (2012) [A Just Transition: Lessons Learned from the Environmental Justice Movement, Duke Forum for Law & Social Change 45-63](#); Just Transition Commission (2021) [A national mission for a fairer, greener Scotland](#).

There are linkages between aspects of a just transition towards Net Zero greenhouse gas emission reductions and climate adaptation.

Box 2

Linking adaptation and emissions reductions together in a just transition

The transition to reduce and eliminate greenhouse gas emissions by mid-century will pose several important just transition challenges, particularly in sectors of the economy that will be required to significantly shrink (e.g., fossil fuel extraction and refining). Many of these will not have significant overlaps with distributional considerations from climate impacts or climate adaptation, however, there are three areas where interactions with Net Zero just transition questions are particularly relevant:

- **Land-use:** Changes in land-use need to meet multiple objectives. These include increasing carbon storage within the landscape, building resilience to climate impacts, supporting biodiversity restoration, sustaining food production, and providing space for sustainable development. Actions to support carbon sequestration, like woodland planting, can affect the distribution of impacts from climate change. For example, large plantations in rural landscapes of inappropriate species for the future climate can increase the exposure of rural residents to health hazards from wildfires, whilst targeted planting in upland river catchments could help significantly reduce flooding risks for down-stream residents. Expanding urban greenspace can reduce the urban heat island effect and increase carbon sequestration and biodiversity, and siting of such expansion could focus on areas where access to green space is currently low, such as neighbourhoods with minority groups and lower income households.
- **Buildings:** A critical action to reduce emissions from buildings is to improve the thermal efficiency of houses. Improved energy efficiency can reduce impacts on health and comfort in periods of extreme cold; the most significant of these impacts are currently felt in poorly insulated houses often occupied by people with lower incomes. In periods of extreme heat (which are projected to become more frequent and intense in future) more insulated homes can have a beneficial effect in reducing the flow of heat into the home but can also trap heat from solar gains inside the building, leading to possible increased health risks from overheating. Vulnerable occupants, for example elderly residents, can be disproportionately affected by overheating and lower income households may also have reduced adaptive capacity for measures to reduce heat exposure.
- **Power system:** Electrification of heating, road transport and aspects of industry is one of the most important levers to reduce emissions across the economy. Achieving this significantly raises the exposure to weather-related failures of electricity generation, transmission, and distribution systems. Recent storms across Scotland and Northern England show that it is often more remote parts of the country that are most vulnerable to these impacts and where it takes longer for power to be restored.

These measures to reduce greenhouse gas emissions all have connections to how climate impacts will be felt across society. Planning for a just transition to a low carbon economy must therefore also consider these effects on how climate impacts will be experienced.

Source: CCC analysis; Public Health England (2020) *Improving access to greenspace: A new review for 2020*.

Scotland has already established initiatives to consider just transition in climate policy.

The Scottish Government has funded significant initiatives in Scotland to engage with the public and industry around a just transition to Net Zero greenhouse gas emissions. For example, Scotland's Climate Assembly was convened to discuss potential actions to reduce emissions, including their effects on different parts of society. It concluded that there was a need to 'tackle the climate emergency in an effective and fair way' and Scotland's first Just Transition Commission provided recommendations for how this could be achieved.

Scotland and the UK have existing commitments to just transition relevant to climate adaptation.

These initiatives haven't focused on the distributional aspects of climate impacts and adapting to climate change. However, the UK and Scottish Governments already have commitments to ensuring a just transition that extend to climate resilience and adaptation:

- In 2018, the UK signed the Solidarity and Just Transition Silesia Declaration, along with around 50 other countries, recognising the challenges faced by different sectors in transitioning to low-greenhouse gas emission and climate resilient economies and stressing the importance of a just transition.
- The second SCCAP includes an outcome that 'the people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy', stating that 'the Scottish Government champions climate justice, and promotes a people-centred, human-rights approach that shares the benefits of equitable low carbon development, and the burdens of climate change fairly'.

It is against this background, that the Committee has developed its advice on the just transition in relation to climate change adaptation.

2. Distributional effects of climate change and adaptation

The effects of climate change will be felt across all of society, but they will not affect the whole of society equally. This is also the case for the effects of adaptation efforts to address these same climate change risks. This section explores the potential distributional effects from climate change impacts and adaptation action in turn.

a) Climate change impacts

Patterns of exposure and vulnerability create unequal impacts of climate change on society.

Future climate risks are a function of hazard, exposure and vulnerability. Together with adaptive capacity these factors combine to determine who across society is most likely to be adversely impacted:*

- **Hazard:** The potential occurrence of a natural or human-induced weather event or trend that may cause health impacts or damage to property, infrastructure, livelihoods, service provision, ecosystems, or environmental resources. Hazards alone do not create distributional effects.
- **Exposure:** The presence of people; livelihoods; ecosystems; environmental resources; infrastructure; or economic, social or cultural assets in places that could be affected by hazards.
- **Vulnerability:** The propensity to be adversely affected if exposed to a hazard. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and the lack of capacity to cope and adapt.
- **Adaptive capacity:** The ability and resources to adjust to changes in the climate and weather. Some people have much greater adaptive capacity to specific risks than others, often associated with particular socio-economic characteristics (e.g., income, gender, etc).

Parts of society also have very different levels of ability to take effective adaptation actions.

Table 1 presents factors of exposure, vulnerability, and adaptive capacity for several groups of climate risks that were highlighted as most urgent for Scotland in the latest Independent Assessment of UK Climate Risk.[†] Only the direct characteristics which make people vulnerable to risks or leave them with limited capacity to adapt are included within the table. Many of these characteristics, such as income, may be associated with other characteristics, such as race, gender and class, that are themselves indirect drivers of vulnerability and lower adaptive capacity across climate risks.

* Definitions used here are consistent with those used by the Intergovernmental Panel on Climate Change.

[†] Climate impacts on ecosystems are not included in this table due to the complexity of how these impacts will ultimately result in differing impacts across society which are likely to be especially context specific – however delivering adaptation action to protect nature will be a vital part of successful just transition efforts.

Table 1
Distributional impacts for several key climate risks

Risk grouping	Who is the most exposed to the risk?	Who is most vulnerable?	Who has the least adaptive capacity?
Impacts of high temperature on health	Urban residents (urban heat island effect) Outdoor workers (construction, agriculture, manufacturing, tourism, etc)	Elderly & young people People with health conditions Residents of poor-quality housing or people with nomadic lifestyles People with limited access to outdoor shading (e.g., in public parks)	People with low incomes (e.g., unable to afford cooling) Residents without ability/control to ventilate their property sufficiently (e.g., living in residential care)
Flooding and coastal erosion	Residents and businesses in flood (river, coastal and surface water) or coastal erosion risk areas	Elderly & young people People with health conditions Residents of poor-quality housing (e.g., mobile homes) or people with nomadic lifestyles Residents of areas with limited community flood response services Uninsured or under-insured households	People with low incomes (unable to afford property flood protection/insurance) Those with limited information/experience regarding flooding risks Those subject to restrictive property tenure
Infrastructure disruption and failure	Residents/businesses with critical infrastructure connections to or through significant flood risk areas Mountainous areas/abandoned mining areas where transport infrastructure is prone to landslide risk	Rural, remote or island communities with less numerous infrastructure links (e.g., single train lines) Those with employment or health needs dependent on infrastructure functioning (e.g., transport system) People with low incomes (unable to afford more costly alternatives at times of infrastructure failure)	
Climate/weather related supply chain disruption	Businesses with long and complex supply chains Businesses sourcing from geographically concentrated sets of suppliers.	Businesses relying on 'just-in-time' models or perishable goods Businesses or consumers in remote areas at times of shortages Low-income consumers at times of price spikes	Small and medium-sized enterprises with more limited access to data, technology or tools to profile risks and diversify business models/supply chains
Risks to agricultural, fishery, and forestry productivity	Rural communities and businesses		Small farms and businesses with limited resources, options or capability to diversify production

Source: CCC analysis; Sanchez-Guevara, C. et al. (2019) Assessing population vulnerability towards summer energy poverty: Case studies of Madrid and London. *Energy and Buildings*, 190, 132-143; Sayers and Partners (2017) *Present and future flood vulnerability, risk and disadvantage: a UK scale assessment*; Jaroszowski, D., Wood, R. & Chapman, L. (2021) Infrastructure. *The Third UK Climate Change Risk Assessment Technical Report*; Surminski, S. (2021) Business and industry. *The Third UK Climate Change Risk Assessment Technical Report*.

Notes: This table is not an exhaustive list of climate impacts and their distributional consequences, but instead seeks to demonstrate a framework which can be used to better understand which groups may be disproportionately impacted by aspects of climate change. Five risk groupings are presented in the table, based on the most urgent risks to Scotland. There are several natural environment risks which impact habitats and species and where more action is urgently needed in Scotland but identifying distributional effects and inequalities on people and communities was too complex and context specific to include within this table. Risks to cultural heritage and risks to public health from climate change overseas have also been excluded from this table as potential distributional impacts are not currently well known.

Low income, old age and ill health can all lead to increased vulnerability and reduced adaptive capacity.

Several characteristics are likely to lead to increased vulnerability and reduced adaptive capacity across multiple categories of climate risk:

- **Low income:** Households with lower incomes are likely to be more vulnerable to multiple climate risks as well as having reduced adaptive capacity to respond. For example, people on lower incomes may not take out flood insurance and therefore may take longer to recover from flooding. Similarly, people on lower incomes may be more impacted by transport disruption as temporary or alternative modes of travel can be more expensive. When businesses are affected by supply chain disruption or reduced agricultural productivity causes food price spikes, lower income households may not be able to absorb the price increases and suffer from reduced access to some products. These can create negative feedback cycles with the cost of these climate impacts lowering income and increasing vulnerability further.
- **Elderly/ill-health:** Some groups which are more vulnerable or have reduced adaptive capacity are well known, for example that very young and elderly people are more vulnerable to negative health impacts during high temperatures and heat waves. Health conditions can also leave people critically dependent on the functioning of infrastructure (e.g., the public transport system for access to treatment) increasing their vulnerability to infrastructure failure.
- **Rural residents:** In more rural or remote areas of Scotland, there is inherently less resilience in transport systems due to less dense infrastructure (for example where there is a single ferry or airline route for an island). The communities using these transport networks are therefore more vulnerable to disruption or failure of transport infrastructure as they may be left isolated, without alternative modes of travel. In addition, remote areas may have rough terrain or limited access, which means these sites take longer to reach and repair after failures, as seen recently during Storm Arwen in 2021.¹ Exposure to climate risks to the natural environment (e.g., impacts on agricultural productivity) is expected to be felt most strongly in rural communities.

Ability to take advantage of opportunities arising from climate change will also be unequal.

The framework used in Table 1 could also be applied to opportunities from climate change which may also be unequally distributed.* An understanding of the distributional effects of both climate risks and opportunities is essential for designing policy to help address adverse distributional impacts.

b) Adaptation actions

Adaptation actions will also affect different parts of society unequally.

Preventative adaptation actions undertaken in a timely manner will avoid future climate impacts and the costs associated with very rapid adaptation implementation if adaptation only occurs once significant climate impacts are already being experienced. However, like climate impacts themselves, these actions will have distributional effects often different to those that might arise from the climate impacts that they are seeking to avoid.

Adaptation actions can have private and public benefits and possible unintended negative consequences.

There are multiple categories of people for whom adaptation actions might benefit and for whom they might inadvertently create negative effects:

* For example, agricultural opportunities may largely benefit existing landowners or business owners with access to sufficient capital to trial new product lines.

- **Private beneficiaries:** We refer to those who receive a direct individual benefit as private beneficiaries of adaptation action. Private beneficiaries will also often (but not always) bear the costs of implementing the adaptation actions in the first place – in this case their private costs need to be lower than their private benefits for the adaptation action to make economic sense.
- **Public beneficiaries:** Some adaptation actions provide wider benefits to communities or society. These may be harder to monetise. For example, restoration of peatland (which helps to make it more resilient to future weather extremes) will have additional benefits such as helping to improve water quality, improve biodiversity and sustain carbon storage.
- **Potential negative consequences:** Adaptation actions can also have (often unintended) consequences with negative impacts on others. For example, protection of a part of coastline with sea defences could exacerbate sea level rise and erosion on other (unprotected) parts of the coast. Adaptation actions can also potentially exacerbate climate risks in other parts of the world. For example, businesses cancelling contracts with suppliers in climate vulnerable countries as part of efforts to climate proof their supply chains, could increase vulnerability to climate impacts in supplier countries.²

Understanding the balance between private beneficiaries, public beneficiaries and the unintended consequences of adaptation actions is an essential step towards ensuring just climate adaptation. Table 2 presents a framework for mapping of the different potential beneficiaries and those at risk of unintended negative consequences for a small number of example adaptation actions.

Table 2

Distributive impacts for adaptation actions

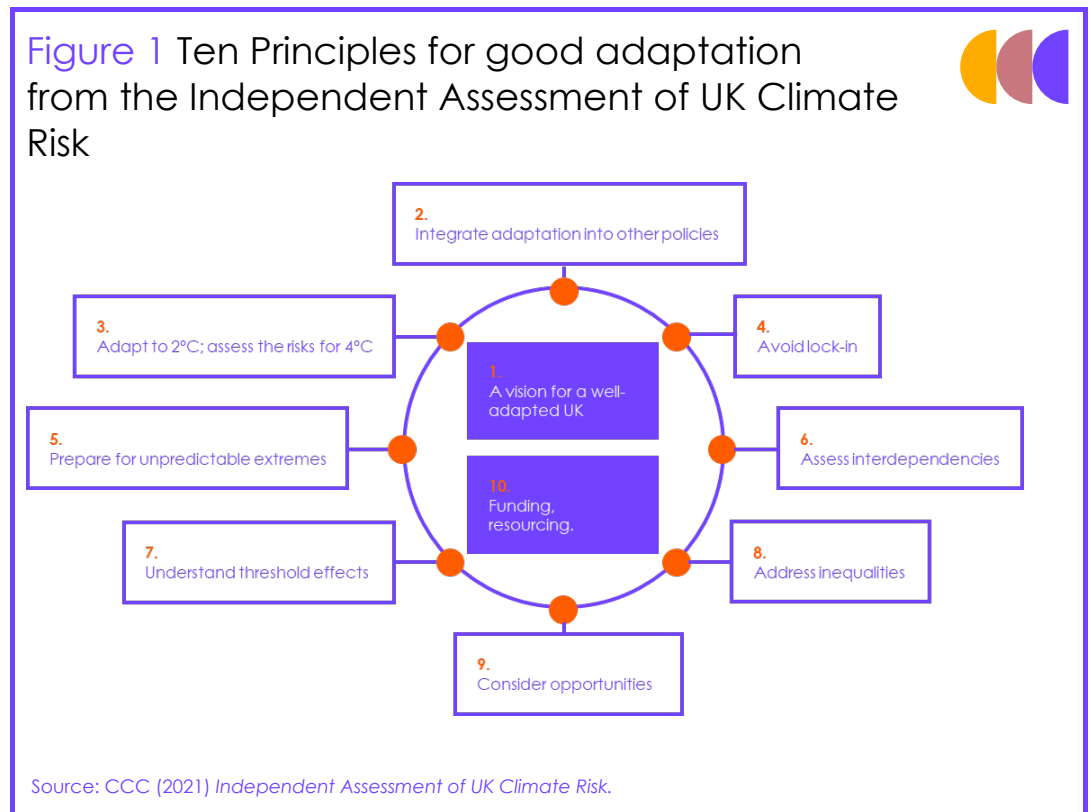
Adaptation action	Who has authority to take the action?	Who are the private beneficiaries?	Who are the public beneficiaries?	Who is affected by potential negative consequences?
Household-level overheating mitigation (e.g. installing shutters)	Owner/occupant	Owner/occupant Businesses (via increased productivity of people working from home & reduced office space needs)	Society (reduced health pressures & avoided health system costs)	
Flood and coastal defence systems	Environmental protection agencies Local authorities	Local residents and businesses (via avoided flooding costs) Local tourism (where attractive or nature-based schemes are implemented)	Wider economy through reduced knock-on impacts (including through reduced cascading failures of critical infrastructure)	Other communities and businesses with increased flood risk through any displacement effects Residents and tourism businesses with reduced recreational access to water bodies
Restoration of peatlands to improve resilience to climate changes	Landowner/land manager	Water companies in the region (through reduced water treatment costs)	Society (improved ecosystem services and carbon sequestration)	Farmers/landowners (agricultural and other opportunity costs of peatland restoration)

Source: CCC analysis.

Notes: Only a small subset of adaptation actions are included within this table as examples to illustrate the framework.

3. Developing just climate adaptation policies

Policy design is critical to the distributional outcomes of adaptation policy. Good adaptation policy must consider inequalities arising from different experiences of climate risks across society and seek to address the inequalities that it may create (Figure 1).



Good adaptation policy requires distributional effects to be considered at all stages of the policy cycle.

Considering distributional impacts is a feature of good policy design in many areas of public policy. However, there are additional specific challenges in the context of climate change adaptation. These include decisions that can be essentially irreversible (e.g. abandonment of coastal settlements that are at risk of sea level rise) and significant uncertainty regarding the long-term climate conditions that adaptation interventions are being designed for. The principles below highlight points in the policy design and implementation cycle where it is particularly important to consider distributional impacts for climate change adaptation.

Policy goal setting:

- 1. Acknowledge that climate change impacts different groups in society differently.** These impacts will be unequally distributed across society with the poor and vulnerable often experiencing the largest impacts (e.g., Figure 2), and often having lower adaptive capacity. This knowledge is key to enabling adaptation policies to be targeted where they are most needed from the outset.

- 2. Acknowledge that adaptation or other policy goals can introduce unintended distributional bias.** Clear and quantitative objectives for the adaptation policy are necessary for good adaptation policy. However, the choice of metric to set policy objectives can introduce unintended incentives for distributional bias. For example, purely aiming to maximise avoided monetised damage (e.g. in flooding protection) could lead to unintended biases towards prioritising protection for more wealthy communities at the expense of poorer ones.

Policy design:

Broad boundaries are needed to ensure that all relevant positive and negative impacts of adaptation actions are fully considered.

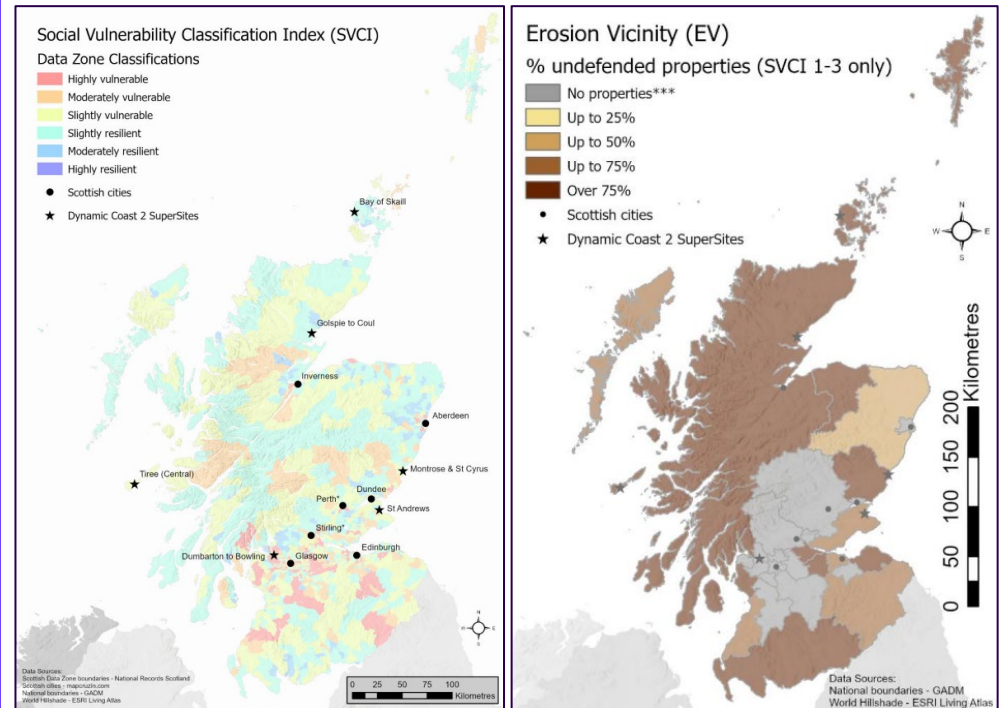
- 3. Set sufficiently broad 'system boundaries' for policy assessment.** The previous two sections described the wide range of ways in which groups of people can be affected, both positively and negatively, by climate impacts and adaptation actions. In weighing up the expected benefits and negative impacts of potential adaptation interventions, a sufficiently broad scope (both spatially and temporally) should be used that captures all the relevant potential winners and losers. For example, full river basins should be considered to capture possible displacement effects from flood protection schemes.
- 4. Engage extensively and regularly with local stakeholders.** Adaptation must be tailored to the specifics of its geographical and social context to be effective in reducing risks for the most vulnerable. This means that extensive consultation and co-design are necessary through the policy design, implementation, and evaluation phases. It is particularly important that both individuals or groups who could be negatively impacted by climate change impacts and those by adaptation actions are adequately included in this process. For irreversible and contentious adaptation policies, such as managed retreat from low-lying coastal settlements, this process will need to be extensive, highly transparent and allow sufficient time for a thorough public deliberation on the options and their likely costs and benefits, as well as the costs and impacts expected without adaptation.

Extensive stakeholder engagement is vital throughout the adaptation policy process.

Implementation and evaluation:

- 5. Rigorously track, evaluate, and communicate distributional outcomes.** Monitoring and evaluation systems need to be put in place so that distributional consequences of adaptation policy programmes can be tracked. This should include impacts on poverty, economic competitiveness and other environment hazards. Putting in place these systems can support public confidence that fairness considerations are a high priority within adaptation policy.
- 6. Implement policy flexibly and iteratively, allowing unanticipated effects to be identified and corrected over time.** Unanticipated distributional consequences from adaptation policy can occur even for well-functioning policy design processes. An important element of ensuring long-term fairness from adaptation policy will be incorporating processes to learn from on the ground implementation, identifying unanticipated effects, and revising the policy accordingly to mitigate them.

Figure 2 Map of coastal erosion disadvantage in Scotland



Source: R.A. Dunkley, et al. (2021). *Dynamic Coast: Mapping Coastal Erosion Disadvantage in Scotland*.
 Notes: Map of social vulnerability classification index (SVCI) across Scotland (left). SVCI is made up of several indicators for population, physical and mental health and wellbeing, cohesive and connected communities, economic prosperity, skills, education and training, sustainable communities and physical assets.
 Map of local authority areas with the proportion of socially vulnerable properties within the projected 2050 erosion vicinity that are undefended by artificial structures (right). Erosion vicinity is the area including assets which may be directly or indirectly affected by coastal erosion/loss of other assets such as roads, based on a high emissions scenario.

4. Recommendations for Scotland

We provide recommendations to extend Scotland's just transition focus to climate change adaptation.

The Scottish Government has already committed to principles of climate justice and a just transition with the establishment of a second Just Transition Commission and its acceptance of the first Just Transition Commission's recommendations.

We recommend three specific near-term actions to incorporate adaptation and climate resilience within this existing just transition focus:

- The Just Transition Commission should include adaptation within its work. Many of the principles outlined by Scotland's Just Transition Commission are also relevant to adaptation policy. The Just Transition Commission should also report annually on Scotland's progress in building climate resilience fairly.
- The Scottish Government should develop and publish an assessment of the characteristics of vulnerability and adaptive capacity across Scotland. Much of the knowledge base needed to understand the distributional consequences of climate impacts and adaptation actions remains at an early stage. This work would aid the capacity for authorities at all levels across Scotland to consider fairness in the design of adaptation policies.
- Expand public engagement activities under the SCCAP to put fairness at the centre of efforts to implement its vision of a well-adapted Scotland. This engagement programme should focus on exploring issues of fairness in some of the most challenging aspects of adaptation (e.g., coastal retreat) and in the provision of public funding for adaptation.

Implementing these three actions would provide a pathway for considerations of fairness to be meaningfully integrated within the current and future SCCAPs.

Endnotes

- ¹ SP Energy Networks, Review of Storm Arwen performance with rural communities:
https://www.spenergynetworks.co.uk/news/pages/review_of_storm_arwen_performance_with_rural_communities.aspx
- ² Adaptation Without Borders (2021) *A Just Transition for Climate Change Adaptation: Towards Just Resilience and Security in a Globalising World*

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Climate Change Committee
1 Victoria Street
Westminster
SW1H 0ET

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