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Public awareness of climate risks and opportunities in Scotland

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Executive summary

Aims

This study aimed to explore the Scottish public's understanding of current and future risks and opportunities posed by a changing climate. It aimed to explore:

- which risks and impacts the public were aware of;
- how serious they considered those risks and impacts to be, both at the moment and in the future;
- awareness of and likelihood of taking actions to manage risks and impacts; and
- awareness of any opportunities arising from a changing climate for Scotland.

Having a better understanding of the public's awareness of the risks of climate change will help provide a platform for more effective engagement at the community and society level. This research therefore aimed to help gauge how informed people in Scotland are about the risks and opportunities posed by climate change, and highlight any gaps that should be the focus of future public and community engagement on adaptation.

Context

This research involved two stages:

1. **A rapid evidence assessment** (REA) of previous quantitative and qualitative studies of public perceptions of climate risks and adaptation in the UK. As part of the REA, four in-depth interviews were carried out with stakeholders to help identify themes and topics for the survey. The REA helped inform the design of the survey and relevant findings are integrated throughout this report.

2. **A nationally representative survey of the Scottish public.** Survey data was collected using an online questionnaire sent to members of Ipsos's UK KnowledgePanel, an online random probability panel. The survey was carried out with 967 adults aged 16+ in Scotland, between 25 November and 1 December 2021.

This research was carried out during a period of extreme weather. Between 25 and 29 November (the same period the survey was carried out), Scotland was experiencing the impacts of Storm Arwen, resulting in widespread and extensive damage across the country and the issuing of a 'Red' weather warning of danger to life. Perceptions of climate change impacts,

particularly those related to extreme weather events, may therefore have been more salient for respondents at this time.

Key findings

Echoing recent trends, concern about climate change in Scotland was high and increasing, and a majority felt that Scotland was already feeling the effects of climate change. When asked what the specific impacts on Scotland were likely to be, respondents tended to focus on weather-related impacts, and extreme weather was generally seen as becoming more common in Scotland.

Weather-related events were generally seen as more of a serious problem for Scotland overall than for respondents' local areas. Perceived seriousness of weather-related impacts was linked to personal experience of those events, and most respondents had experienced at least one type of extreme weather impact.

Risks to both the natural and built environment were also more likely to be seen as a problem for the whole of Scotland than for respondents' local areas. Awareness of the risks to the natural environment was generally high, particularly coastal erosion and threats to wildlife. Similarly, awareness of risks to the built environment and infrastructure was high, particularly in relation to damage to roads, rail or bridges.

Respondents generally recognised the need for action to address the impacts of climate change but were fairly moderate about the perceived efficacy of individual or household actions. There was a sense of confidence in collective action, for example the community coming together to respond to impacts. While respondents were clear in their view that the Scottish Government had most responsibility for preparing Scotland for the impacts of climate change, they were less convinced about whether action would be taken.

Most respondents had already taken, or planned to take, at least one action to help address the impacts of climate change. There was a tendency towards actions like supporting people in their local community, as opposed to, for example, making changes to their properties (which may have been driven by a perception that actions were not relevant or possible for properties).

Concern about climate change and perceived seriousness of risks varied between groups and by location. It tended to be higher among women, younger people (aged 16-34), those educated to a degree level and homeowners. Those living in Glasgow, Lothian and the Highlands and Islands tended to have higher levels of concern or be more likely to say they had experienced certain types of extreme weather (e.g. heatwaves and flood impacts in Glasgow and Lothian, wildfires in Highlands and Islands).

Lessons for future public engagement

Findings from this research point to a number of recommendations for future public engagement on climate risks, impacts and adaptation in Scotland:

- Framing communications about climate impacts around the 'shared experience' of extreme weather events that are widely associated with climate impacts (such as flooding or storms).

- Being clear and consistent in government communications about the link between increases in extreme weather events in Scotland and climate change, and drawing on the public's own understanding of these connections.

- Recognising the public's 'starting point' and framing communications accordingly. For example, as the public tend to feel climate change impacts are more of an issue for wider Scotland than for their local areas, messaging can be tailored to reflect experiences in particular areas. Also, for engagement around risks to the natural and

built environment, using the topics that the public already see as most serious (risks to wildlife, coastal erosion, and road/rail disruption) as the starting point for communicating about other risks.

- Building awareness and understanding of heat-based climate risks, by referring to some of the more widely experienced impacts that people may relate to, such as heatwaves causing people discomfort or being unable to sleep.

- **‘**Framing public engagement in a way that draws on previous research into the factors that motivate climate change adaptation behaviours, such as social norms (i.e. what other people are doing) and perceived sense of efficacy (i.e. whether actions have an impact).

- ‘Community led’ actions are likely to be more effective starting points for engagement on adaptation with the general public than more individual/household level actions. These types of community led actions include taking part in government-led schemes or neighbourhood-level initiatives.

- Consider the role of the Scottish government in demonstrating leadership around climate adaptation and the role of ‘trusted messengers’ (such as local communities, regional initiatives and the organisations that represent them) in leading on communication and engagement campaigns about adaptation.

Contents

1 Introduction

This report presents the findings from research into Scottish perceptions of climate change risks and opportunities. The research was carried out by Ipsos and Adam Corner on behalf of ClimateXChange and the Scottish Government. It included a review of public attitudes towards and public engagement with climate impacts and adaptation in Scotland, as well as a nationally representative survey.

1.1 Background

The current Scottish Climate Change Adaptation Programme[1] takes a place-based and people-centred approach to climate change adaptation. A key sub-outcome of the programme is ensuring that "people in Scotland's diverse communities are informed, empowered and adapting to climate change". It also seeks to identify key "adaptation behaviours" for individuals, communities and society.

The Climate Change Adaptation programmes are a statutory response to the UK Climate Change Risk Assessment (UKCCRA). Independent evidence for this assessment is provided by the Climate Change Committee. The most recent UKCCRA, published in June 2021[2] sets out 61 risks and opportunities from climate change for the four UK nations. The risks and opportunities surveyed in this study stem from the UKCCRA and the UK Climate Projections 2018.

A people-centred approach to climate change policy is also central to the Scottish Government's Climate Change - Net Zero Nation: Public Engagement Strategy[3]. The overall vision of the Public Engagement Strategy is that "everyone in Scotland recognises the implications of the climate emergency, fully understands and contributes to Scotland's mitigation and adaptation response, and embraces their role in the transition to a net zero and climate ready Scotland." To help achieve that vision, one of the strategic objectives is that people actively participate in shaping policies that promote mitigation and adaptation to climate change.

Having a better understanding of the public's awareness of the risks of climate change will help provide a platform for more effective engagement at the community and society level. This research is therefore aimed to help gauge how informed people in Scotland are about the risks and opportunities posed by climate change, and highlight any gaps that should be the focus of future public and community engagement on adaptation.

There is a small but focused literature covering UK climate risk perceptions (synthesised most recently in the RESiL RISK collaboration between Cardiff University and Climate Outreach[4], which also provides a detailed picture of UK climate risk and resilience perceptions in 2019, before the pandemic). However, there is very little work focused specifically on public awareness and understanding of risks in Scotland, as identified in Ipsos MORI's previous evidence review for ClimateXChange[5]. The relative paucity of Scottish-sample based research on climate risks, impacts and adaptive actions is a gap that this research sought to address.

[1] The Scottish Government, 2019 https://www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024/
[2] www.ukclimaterisk.org
[3] Climate change - Net Zero Nation: Public Engagement Strategy Climate change - Net Zero Nation: public engagement strategy - gov.scot (www.gov.scot)
[4] Understanding Risk Research Group, 2020. http://orca.cf.ac.uk/129452/1/resilrisk-FINAL-ONLINE.pdf
[5] Ipsos for ClimateXChange, 2020 https://www.climatexchange.org.uk/research/projects/understanding-and-engaging-the-public-on-climate-change/

1.2 Objectives

Against the policy background outlined above, ClimateXChange and the Scottish Government commissioned this research to help understand Scottish perceptions of climate risks and opportunities. It aimed to explore:

- which risks and impacts the public were aware of;
- how serious they considered those risks and impacts to be, both at the moment and in the future;
- awareness of and likelihood of taking actions to manage risks and impacts; and
- awareness of any opportunities arising from a changing climate for Scotland.

By gaining a greater understanding of public awareness of the risks of climate change, the research also offers recommendations for more effective public engagement on climate impacts and adaptation in Scotland.

1.3 Context

This research was carried out during a period of extreme weather. Between 25 and 29 November (the same period the survey was carried out), Scotland was experiencing the impacts of Storm Arwen, resulting in widespread and extensive damage across the country and the issuing of a 'Red' weather warning of danger to life. The storm affected almost all of Scotland, with impacts being particularly felt in the North East, Dumfries and Galloway and the Borders[6]. Perceptions of climate change impacts, particularly those related to extreme weather events, may therefore have been more salient for respondents at this time.

The survey was also carried out soon after Glasgow hosted the UN Climate Change Conference (COP 26) – this ended on 12 November and the survey was launched on 25 November. The recent widespread media coverage of COP 26 may therefore have had an influence on perceptions of climate change, including overall concern and the seriousness of some of the risks covered in the survey. Recent polling carried out by Ipsos raises questions on whether the particularly elevated levels of concern about climate change at a Great Britain-wide level was driven by this "COP effect" – in December 2021[7], concern about the environment dropped significantly (by 27 points)[8] down the public's overall priorities compared to the previous month[9] (when climate change was selected by 40% of the British public as the most important issue facing the country). The extent to which this trend continues is still to be seen, but we interpret the Scottish findings reported here with this GB-wide polling context in mind.

1.4 Methodology

This research involved two stages:

1. **A rapid evidence assessment** (REA) of previous quantitative and qualitative studies of public perceptions of climate risks and adaptation in the UK (including Scotland-specific data where available). As part of the REA, four in-depth interviews were carried out with stakeholders to help identify themes and topics for the survey. The REA helped inform the design of the survey and relevant findings are integrated throughout this report.

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[6] Storm Arwen response: Deputy First Minister statement, November 2021, https://www.gov.scot/publications/response-storm-arwen/
[7] Ipsos issues index, December 2021 https://www.ipsos.com/en-uk/ipsos--issues-index-december-2021
[8] The top issue December 2021 was coronavirus, which reflects the timing of fieldwork - it took place soon after news of the emergence of the Omicron variant of COVID-19.
[9] Ipsos issues index, November 2021 https://www.ipsos.com/en-uk/ipsos--issues-index-november-2021

2. **A nationally representative survey of the Scottish public.** Survey data was collected using an online questionnaire sent to members of Ipsos MORI's UK KnowledgePanel, an online random probability panel. The survey was carried out with 967 adults aged 16+ in Scotland, between 25 November and 1 December 2021. The questionnaire is provided in Appendix A. To ensure a representative sample, data was weighted by age, gender, region, Scottish Index of Multiple Deprivation (SIMD) quintile[10], education, ethnicity and number of adults in the household in order to reflect the profile of the population in Scotland.

In this report, where survey results shown in charts do not sum to 100%, this may be due to computer rounding, multiple responses, or the exclusion of "don't know" categories.

[10] The Scottish Index of Multiple Deprivation is a relative measure of deprivation across 6,976 small areas (called data zones). It looks at the extent to which an area is deprived across seven measures: income, employment, education, health, access to services, crime and housing. https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020/

2 Concern about climate change impacts

This chapter outlines levels of concern about climate change and its impacts in Scotland, including perceptions of when Scotland will be feeling the impacts of climate change and views on what those impacts are likely to be.

The findings outlined in this chapter sit within a wider context of recent surging levels of climate concern, which continued unabated through the pandemic and into 2021. Studies tracking the climate views of different segments of British society by the Britain Talks Climate team at Climate Outreach revealed an unwavering recognition of the seriousness of the climate crisis[11]. Scottish data showed the same trend, with around a quarter of the population reporting they had become more concerned about climate change since the onset of Covid 19[12]. British polls from Ipsos MORI revealed another leap around the importance of climate change to the British electorate in the run up to and during COP26, with 40% of the country selecting climate change/environment as the most important issue facing the country in November 2021[13]. However, relatively little of the data collected during the period of the pandemic on climate change has focused specifically on perceptions of climate impacts or adaptation.

2.1 Concern about climate change

- **Concern was high, both in relation to climate change generally and its impacts on Scotland specifically.**
- **Around half of respondents said their concern about climate change had increased over the past 12 months.**
- **Concern was higher among younger people and those with personal experience of extreme weather events.**

2.1.1 Current concern

Concern about climate change was high, with the majority (82%) saying they were either very (41%) or fairly (41%) concerned at the moment. When thinking about the impact of climate change on Scotland specifically, concern was also high but slightly less so than in relation to climate change generally: 76% were either very (28%) or fairly (48%) concerned. (Figure 2.1).

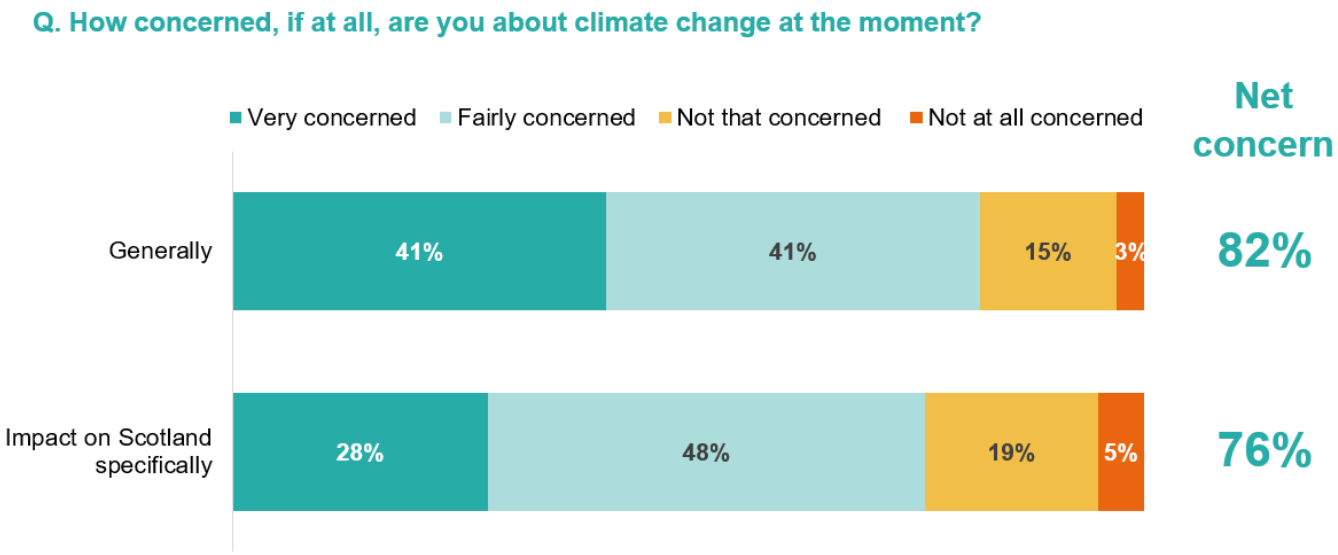
While a majority were concerned on both measures, a sizeable minority (24%) said they were *not* concerned about the impact of climate change on Scotland, and 18% said were not concerned about climate change generally.

[11] Climate Outreach https://climateoutreach.org/reports/britain-talks-climate/

[12] Ipsos for the Scottish Government, 2020 https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/12/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/documents/research-public-attitudes-climate-change-policy-green-recovery/research-public-attitudes-climate-change-policy-green-recovery/govscot%3Adocument/research-public-attitudes-climate-change-policy-green-recovery.pdf

[13] Ipsos https://www.ipsos.com/en-uk/public-concern-about-climate-change-and-pollution-doubles-near-record-level

Figure 2.1 – Concern about climate change



Base: All respondents (967)

High concerns about climate change and its impacts echo the findings from other recent research. GB-wide polling saw concern about climate change reach 85% in August 2021, the highest level recorded on Ipsos's regular Political Monitor[14] (with 13% not concerned). Similarly, in Scotland data from the Scottish Household Survey (SHS) shows that since 2013[15], the proportion of the Scottish public who agree that climate change is an immediate and urgent issue has grown over time, while the proportions thinking that it's a problem for the future, not a problem, or not happening have all fallen over time. This is a long-term trend, reflected in previous research over the last decade[16].

Concern about climate change was fairly widespread, however some notable variation did emerge:

- Concern was higher than average among 16-34 year olds: 89% were concerned generally and 85% in relation to the impacts on Scotland specifically. This is similar to findings from previous research by Ipsos[17], which found that young people (aged 16-24) were the age group most concerned about climate change in Scotland. It is worth nothing, however that polls[18]have also pointed to a growing sense of fatalism towards climate change among younger age groups - but this relates to cynicism and weariness about the pace of climate policies not the reality or urgency of the issue.

- Women were more likely to be concerned than men about impacts on Scotland (78% vs 73%)

- People living in Glasgow were more concerned than average about climate change generally (93%) and its impacts on Scotland (88%). This may reflect the timing of the survey, taking place shortly after COP26 took place in the city (fieldwork started 25 November, and COP26 ran until 12 November).

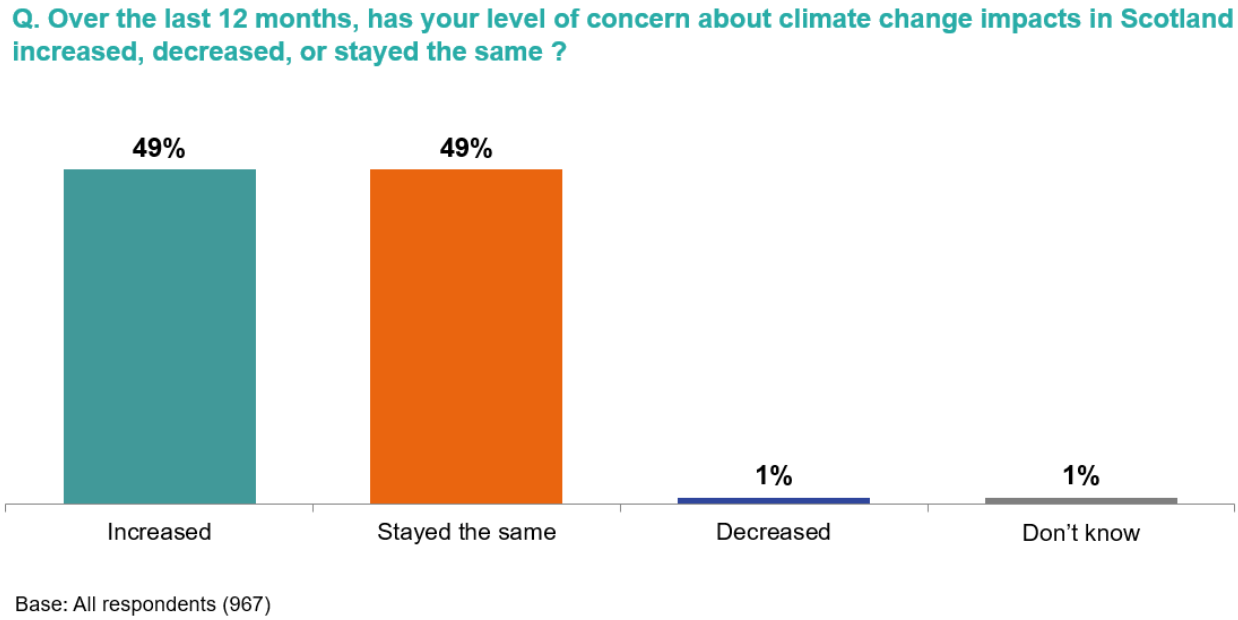
[14] Ipsos Political Monitor, 2021, https://www.ipsos.com/ipsos-/en-uk/high-levels-concern-about-climate-change-scepticism-whether-britons-will-change-behaviours
[15] Scottish Government, 2019. https://www.gov.scot/publications/scotlands-people-annual-report-results-2018-scottish-household-survey/
[16] Understanding Risk Research Group, 2020. http://orca.cf.ac.uk/129452/1/resilrisk-FINAL-ONLINE.pdf
[17] Ipsos, 2020 https://www.ipsos.com/en-uk/84-percent-scots-are-concerned-about-climate-change
[18] Ipsos and Futerra, 2021 https://www.ipsos.com/en-uk/climate-fatalism-grips-young-people-worldwide-while-urgency-solution-oriented-media-grows

- Concern was also higher among those that had personal experience of extreme weather events (see chapter 3), both in relation to climate change generally (85% vs 67% of those without personal experience) and its impacts on Scotland (79% vs 59%).

2.1.2 Change in concern over past 12 months

Reflecting the trend of rising concern noted above, around half (49%) of respondents said their level of concern about climate change impacts in Scotland had increased over the last 12 months. The same proportion (49%) said their level of concern had stayed the same, while just 1% said it had decreased. (Figure 2.2).

Figure 2.2 - Change in concern about climate change impacts



Base: All respondents (967)

Women were more likely than men to say their concern had increased (53% vs 45%). Previous international research[19] also shows a small – but consistent – gender gap in environmental views and climate change opinions. It has found that, on average, women are slightly more likely than men to be concerned about the environment and have stronger pro-climate opinions and beliefs. US findings specifically show that women consistently have higher risk perceptions that global warming will harm them personally, and will harm people in the U.S., plants and animals, and future generations of people - i.e. elevated risk perceptions around climate risks/impacts.

Increase in concern was higher than average among respondents in the Highlands and Islands (62%). This reflects views expressed in stakeholder interviews carried out for this project, which suggested that the salience and perceived urgency of climate impacts in these parts of Scotland was increasing, due to the worsening impacts of extreme weather and coastal erosion on island communities in particular.

Increased concern was also linked with personal experience of extreme weather events: 52% of those that experienced these events said their concern had increased, compared with 27% that had not.

[19] Ballew et al,. 2018, at: https://climatecommunication.yale.edu/publications/gender-differences-in-public-understanding-of-climate-change/

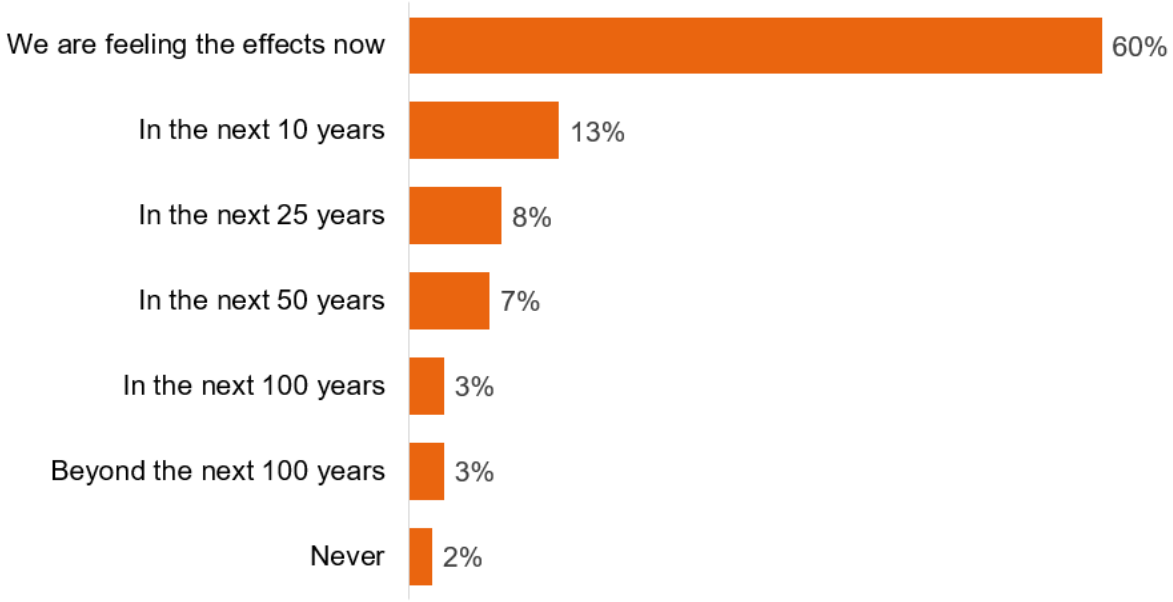
2.2 Timescale for the impacts of climate change

- **Almost two thirds felt that Scotland was already feeling the effect of climate change.**
- **This was higher for women, those in least deprived areas and those with personal experience of extreme weather impacts.**

A majority (60%) of respondents felt that Scotland was already feeling the effects of climate change. Around a third (34%) felt that these effects would be felt some time in the future, with 13% saying this would be within the next 10 years and 21% some time beyond that. (Figure 2.3).

Figure 2.3 –Timescale for feeling the effects of climate change

Q. When, if at all, do you think Scotland will be feeling the effects of climate change?



Base: All respondents (967)

Findings are similar to those in previous GB-wide research in 2019, which found that 64% of respondents felt that we were already feeling the effects of climate change, a proportion that had been steadily increasing over the preceding decade[20].

Belief that Scotland was already feeling the effect of climate change was higher among:

- women (65% compared with 55% of men),
- those in the least deprived[21] areas (63% compared with 47% of those in the most deprived),
- those concerned about climate change impacts on Scotland (73% vs 20% of those not concerned), and

[20] Understanding Risk Research Group, 2020. http://orca.cf.ac.uk/129452/1/resilrisk-FINAL-ONLINE.pdf

[21] Based on the Scottish Index of Multiple Deprivation (SIMD) with "least deprived" being within the 20% least deprived areas in Scotland, and "most deprived" being within the 20% most deprived.

- those with personal experience of extreme weather impacts (63% vs 40% of those without).

The differences in views by gender have also been seen in other Great Britain-wide research. Survey research by Comres[22] has shown that men were more likely than women to feel that the impacts of climate change had been exaggerated, while women were more likely to feel that human activity was the principal cause behind climate change.

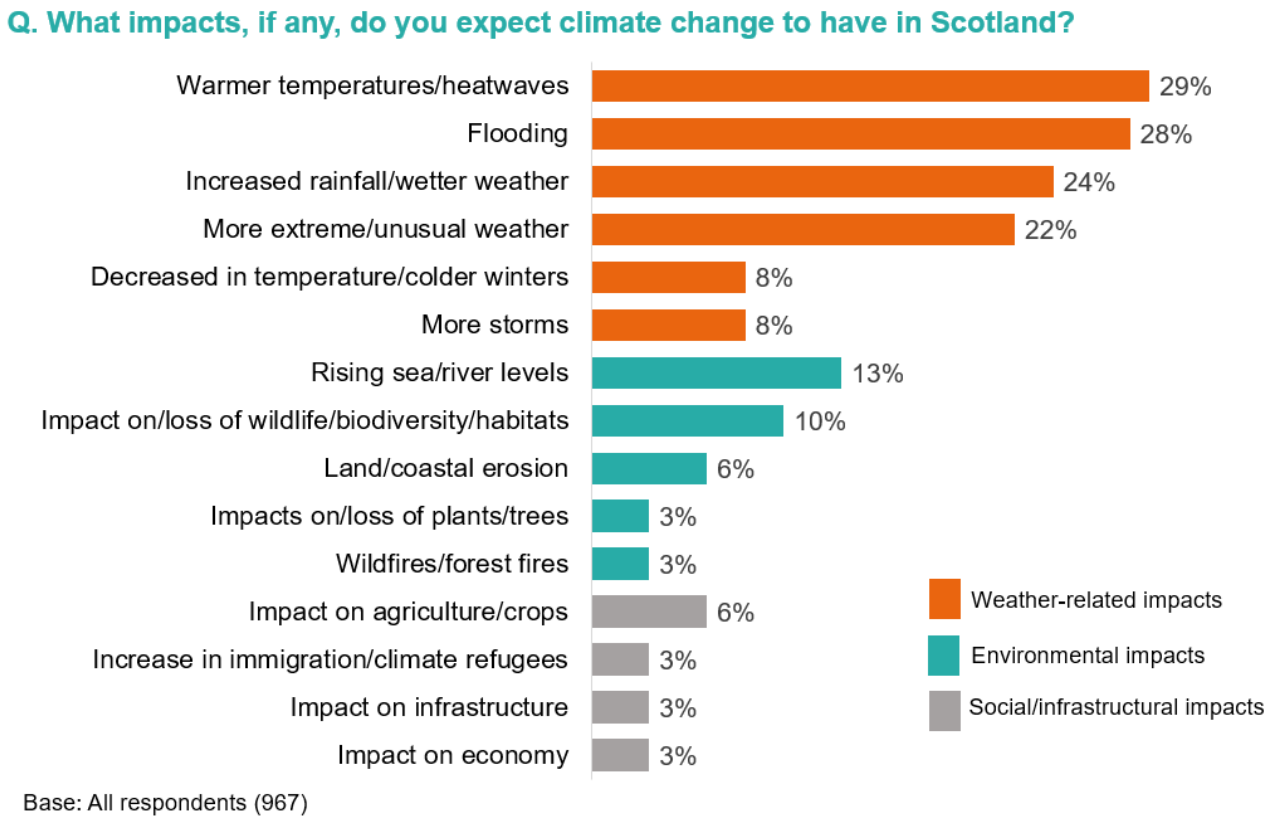
Differences by deprivation level are not clear from the data, but the findings are echoed in findings from the Scottish Household Survey[23], which found that those in the least deprived areas in Scotland were more likely see climate change as an urgent problem (75%) compared with those in the most deprived areas (52%).

2.3 Anticipated impacts of climate change

Anticipated impacts of climate change were largely associated with extreme weather, particularly warmer temperatures, flooding and wetter weather.

Respondents were asked, unprompted (using an open text response), what impacts they expected climate change to have in Scotland. The most common answers related to changes in the weather (74% of responses were weather-related), while around a third (30%) mentioned impacts on the natural environment and around a fifth (21%) mentioned social or infrastructural impacts. The top responses under each of these themes are illustrated in Figure 2.4.

Figure 2.4 - Anticipated impacts of climate change (unprompted)



[22] Comres, 2019, http://comresglobal.com/wp-content/uploads/2019/05/Climate-Change-ComRes-Poll-April-2019.pdf

[23] Scottish Government, 2019, https://www.gov.scot/publications/scotlands-people-annual-report-results-2018-scottish-household-survey/

Respondents living in rural areas were more likely than those in urban areas to say they expected increase in rainfall/wetter weather (32% compared with 21%). There was further variation by location, with these areas having higher than average mentions of certain impacts:

- Glasgow - decrease in temperature or colder winters (14%),
- Highlands and Islands (24%) - rising sea or river levels, and
- Lothian - more extreme and unusual weather (32%) and rising sea or river levels (21%).

Respondents' anticipated impacts of climate change suggest somewhat of a mismatch between perceived risks of climate change and actual risks. For example, although only 3% spontaneously mentioned wildfires or forest fires, the Scottish Fire and Rescue Service estimated that there has been a 30% rise in wildfires since 2010 and anticipates a similar rise is likely in the next decade.

2.4 Lessons for future public engagement

The findings support long-term trends showing rising concern about climate change, and a rise in the proportion of people agreeing that climate change is an immediate and urgent issue (rather than a problem for the future) and that climate impacts are taking place in the 'here and now'. Indeed, there is a significant proportion of the Scottish population (see Chapter 3) who feel they have personally experienced extreme weather events (moreover, the sorts of events – such as flooding or heatwaves) that they think will become more common due to climate change.

This 'shared ownership' of having experienced certain extreme weather events that are widely accepted/understood as climate impacts (e.g. flooding and heatwaves) is directly relevant for communicating with public audiences about climate change. The literature is clear that people may not automatically attribute their experience of extreme weather to climate change - but with the right communications approaches, these shared experiences can be used as the basis for crafting narratives that build on a shared/growing sense of 'experiencing the effects of climate change'. Advice from Climate Outreach on engaging around extreme weather events for UK audiences includes:

- Recognise that experiencing extreme weather can be highly stressful and traumatic, and that people may not want to talk about climate change whilst experiencing extreme weather - conversations about climate change should ideally happen before (not during) flood events when communities are under pressure.
- Statistical information and accurate scientific data are crucial, but trusted 'peer' messengers and personal stories are vital for achieving public engagement.
- Avoid a sense of despair/fatalism and build efficacy by highlighting practical steps that people can take to reduce their vulnerability to climate impacts in the future.[24]

From an engagement point of view, it is also important to note the types of extreme weather events that the Scottish public does not yet strongly associate with climate change, have not yet personally experienced or do not perceive as a serious problem for Scotland. These include:

- Wildfires and droughts (there is a relatively low recognition of these impacts in Scotland)
- Heatwaves (although many have experienced the negative impact of extreme heat through e.g. disrupted sleep, there is relatively limited concern currently about the seriousness of heatwaves for Scotland currently - see further recommendations below)
- Impacts on the economy (there is a relatively low recognition that climate impacts will have economic consequences in Scotland).

[24] Climate Outreach https://climateoutreach.org/reports/communicating-flood-risks-in-a-changing-climate/

3 Weather-related impacts

This chapter explores experience of and attitudes towards weather-related impacts of climate change. It outlines respondents' views on whether certain weather-related events had become more or less common and their perceived seriousness for both Scotland and local areas. It then looks at respondents' own personal experiences of extreme weather and their risk from flooding.

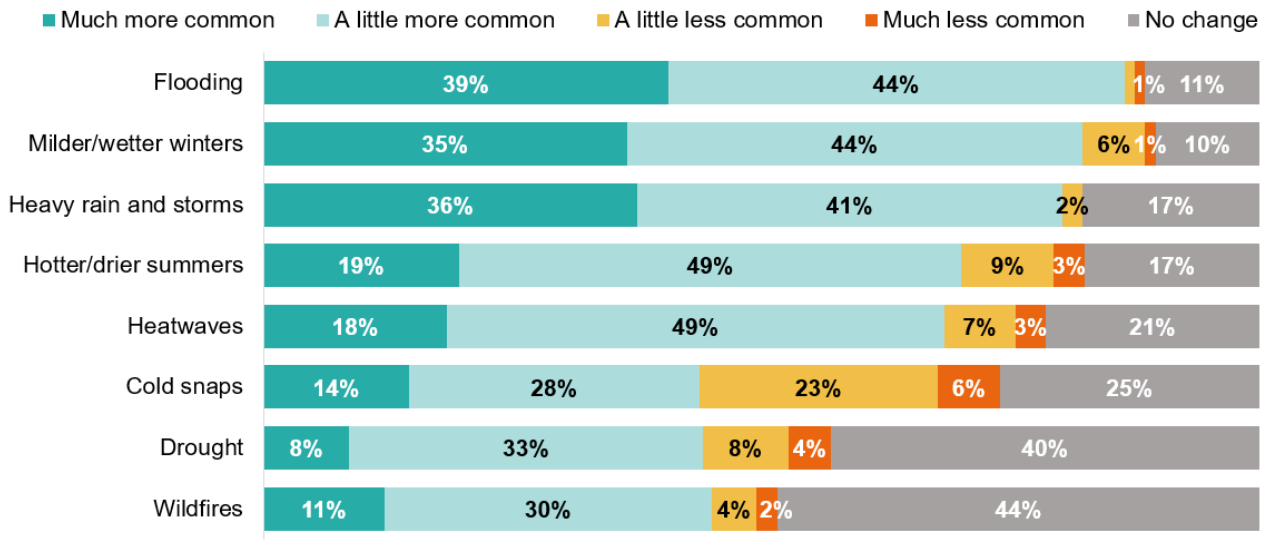
3.1 Occurrence of weather-related events

Extreme weather events were generally seen as becoming more common, particularly flooding, milder/wetter winters, heavy rain and storms.

Of the eight weather-related events asked about, a majority felt that five of these had become more common in the last few years: flooding (83%), milder/wetter winters (79%), heavy rain and storms (77%), hotter/drier summers (68%) and heatwaves (67%). Views were more mixed on the other types of weather: around two-fifths of respondents felt that cold snaps (42%), drought (41%) and wildfires (41%) had become more common, but a similar proportion felt that occurrence of drought and wildfires had not changed at all (40% and 44%). (Figure 3.1).

Figure 3.1 – Occurrence of weather-related events

Q. Do you think the following weather-related events have become more common, less common, or not changed in Scotland in the last few years?



Base: All respondents (967)

Views on the occurrence of these weather events was higher than average in certain locations and age groups:

- Respondents from Glasgow felt that cold snaps were more common (57% vs 42% overall), while those from the Highlands and Islands felt wildfires had become more common (57% vs 41% overall).

- 16-34 years olds were more likely than average to feel that heatwaves (85%) hotter/drier summers (81%), cold snaps (64%) were more common, and 25-34 year olds were more likely to say that droughts (55%) were more common.

Perception of each event becoming more common was also higher among those that were concerned about climate change, felt their concern about climate change had increased, had personal experience of extreme weather, and felt that Scotland was already feeling the effects of climate change.

3.2 Seriousness of weather-related events

- **Flooding, heavy rain and storms were seen as the most serious weather-related problems facing Scotland.**
- **Other weather-related events were considered more as problems for the future than for now.**
- **Weather-related events were generally seen as more serious a problem for Scotland overall than for local areas.**

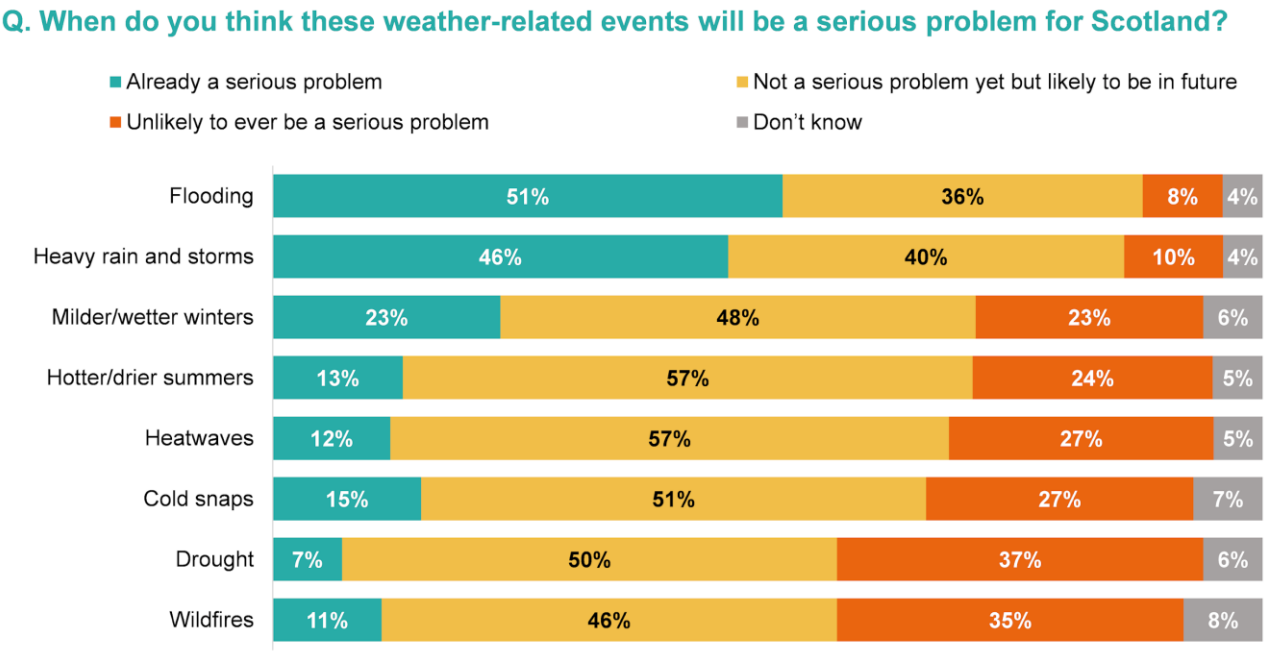
3.2.1 Scotland

Flooding and heavy rain and storms were seen as the most pressing of the weather-related problems covered in the survey – around half said that these were already a serious problem for Scotland (flooding 51%, heavy rain and storms 46%), with more than a further third saying these were likely to be problems in future (36% and 40% respectively).

Other weather-related events (milder/wetter winters, hotter/drier summers, cold snaps, heatwaves, wildfires and droughts) were generally viewed more as future problems: around half (between 46% and 57%) of respondents said that these were not a serious problem now, but likely to be in future. This stands in contrast to GB-level data from 2019, where the RESiL RISK project found a qualitative shift in the way people viewed the risks from extreme heat or extended periods of hot weather compared to previous years. More than 70% of respondents in the RESiL RISK survey thought that heatwaves would be more common by mid-century and reported being concerned about this.

There was also some scepticism about whether these weather-related risks were ever likely to be problems for Scotland. In particular, over a third felt that drought (37%) and wildfires (35%) were unlikely to ever be a problem for Scotland. Around a quarter thought the same in relation to cold snaps (27%), heatwaves (27%), hotter/drier summers (24%) and milder/wetter winters (23%). (Figure 3.2).

Figure 3.2 – Seriousness of weather-related events for Scotland



Base: All respondents (967)

These findings echo some of those of the GB-wide RESiL RISK research[25], which found that storms and flooding were highest perceived weather-related risks. Further, in a 2020 GB poll by Ipsos MORI[26] using a more general question about 'environmental change', 38% those who said they had been negatively affected by environmental change recalled storms and 34% mentioned flooding (the top two responses, after air pollution).

Views on the seriousness of these weather events varied by age along similar lines to those seen earlier in relation to occurrence of extreme weather, with 16-34 year olds more likely than average to say hotter/drier summers (25%) and heatwaves (23%) were already serious problems.

Across all the weather events explored, belief that they were unlikely to ever be a problem was higher among men than women.

3.2.2 Local areas

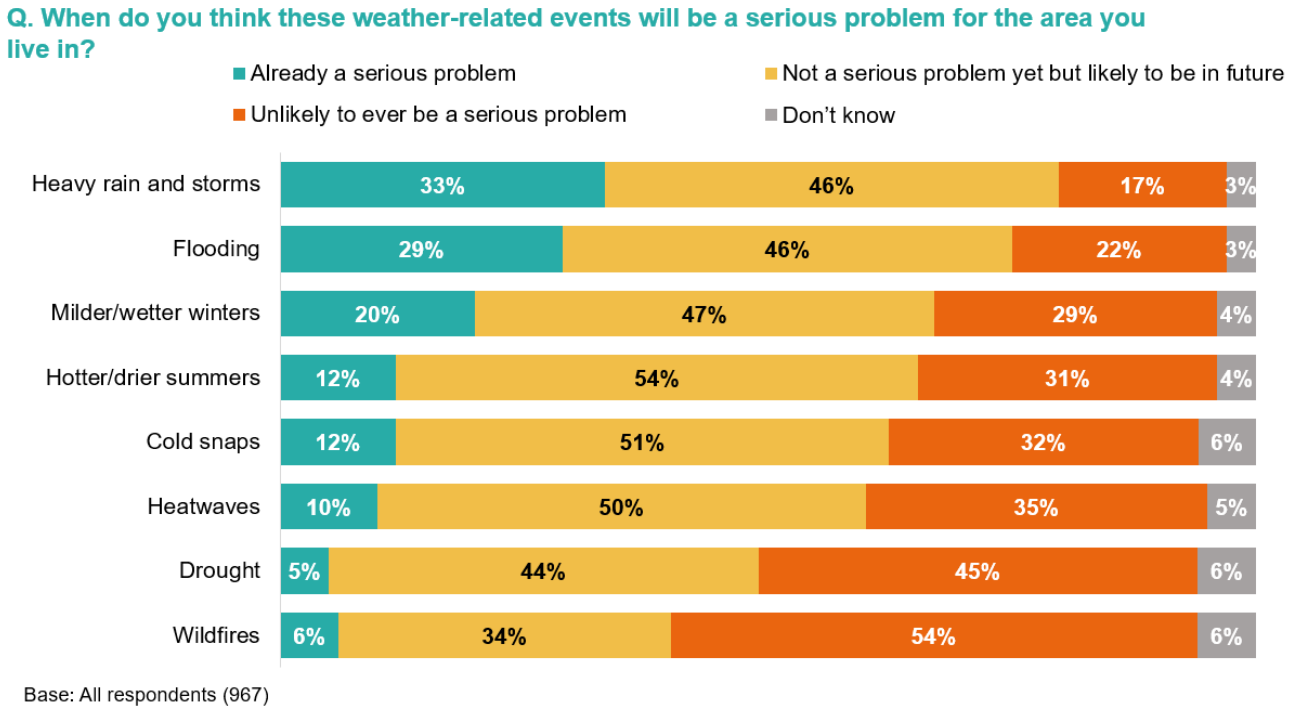
Respondents were asked when they thought weather-related events would be a serious problem for the area they lived in. It should be noted that "the area you live in" was not defined in the questionnaire, therefore was open to respondents' own interpretation.

Respondents were less likely to feel weather-related events were a serious problem for the area they lived in than they were for Scotland as a whole. No more than a third saw any of the events as a current serious problem (generally lower than the proportions for Scotland shown above). The top two issues were again heavy rain and storms and flooding, considered serious problems by 33% and 29% respectively.

Around one in five felt that heavy rain and storms and flooding were unlikely to ever be serious problems or their area, while around a third (between 29% and 35%) said the same for milder/wetter winters, hotter/drier summers, cold snaps and heat waves. Drought and wildfires were least likely to be seen as local problems. (Figure 3.3).

[25] Understanding Risk Research Group, 2020. http://orca.cf.ac.uk/129452/1/resilrisk-FINAL-ONLINE.pdf
[26] Ipsos , 2020 https://www.ipsos.com/sites/default/files/ct/news/documents/2020-02/ipsos-omnibus-environmental-impact-poll-feb-2020.pdf

Figure 3.3 – Seriousness of weather-related events for local areas



As seen above in relation to in Scotland, these weather events were likely to be viewed as serious problems among 16-34 year olds and women.

There was further variation by location, with the following locations having higher than average responses:

- Glasgow[27] – heavy rain and storms (47%) and milder/wetter winters (28%) were seen as already serious problems.
- Highlands and Islands – wildfires (17%) considered already a serious a problem.
- West of Scotland – heatwaves (18%) seem as already a problem and cold snaps unlikely to ever be a problem (43%).

3.3 Personal experience of extreme weather and flood risk

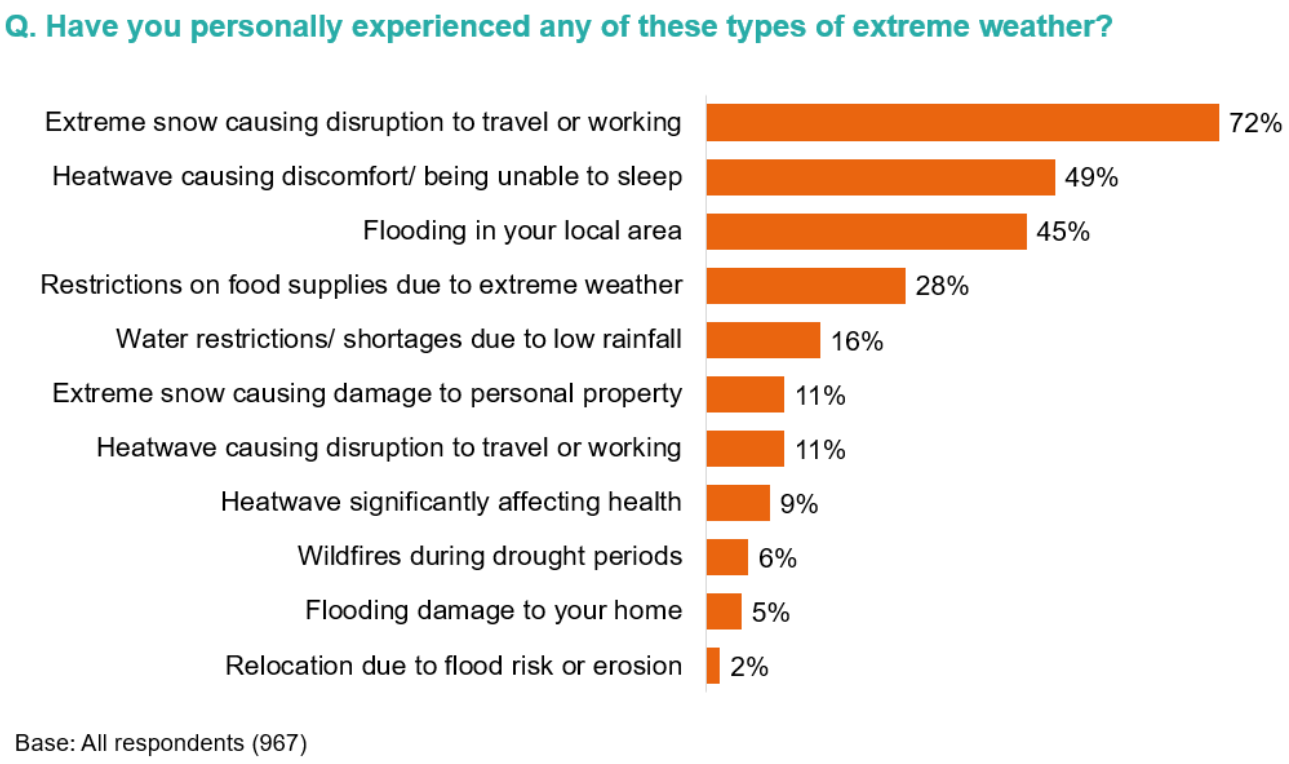
- **Most respondents had experienced impacts of extreme weather, most commonly snow causing disruption to travel or working.**
- **Most felt their homes were not currently at risk of flood, while one-in-ten felt they were.**

3.3.1 Experience of extreme weather

Overall, 86% had personal experience of at least one type of extreme weather impact. The most common was extreme snow causing disruption to travel or working (72%), followed by heatwaves causing discomfort or being unable to sleep (49%) and flooding in the local area (45%). (Figure 3.4).

[27] Respondents in Glasgow were younger than the overall sample (e.g. 53% of respondents in Glasgow were aged 16-34, compared with 27% of the overall sample). Therefore findings in Glasgow may, at least in part, be influenced by the views of this younger age group.

Figure 3.4 – Personal experience of extreme weather impacts



Base: All respondents (967)

Experience vs attitudes towards heatwaves

Findings suggest an apparent disparity between personal experience and perceived seriousness of heatwaves. Discomfort or difficulties sleeping due to heatwaves was the second most common weather-related impact (experienced by 49% of respondents). However, as shown in figures 3.2 and 3.3, heatwaves were viewed as comparatively less serious problems for Scotland, or for respondents' local areas, than heavy rain/storms, flooding, milder/wetter winters and hotter/drier summers.

This apparent disparity may be a result of the way weather risks are communicated to the public. Recent analysis, led by the Candice Howarth at University of Surrey[28], argues that the public is not sufficiently informed or aware of the risks from heat including of hot weather outside of heatwave periods. It also states that hot summers can evoke "feelings of nostalgia" and "foster perceptions that individuals are safer than they really are", and that communicating and evoking more negatives impacts of extreme heat may change these perceptions.

Comparison with previous research and variation in findings

There were some notable differences between these findings and those of the GB-wide research carried out by RESiL RISK in 2019[29]. In comparison with that survey, our findings show higher proportions having experienced flooding and disruption or damage due to extreme snow, but lower proportions saying they had experienced impacts related to heatwaves. This may reflect geographic differences in the samples, with different weather impacts in Scotland than in the rest of GB, or differences due to timing of the survey – as noted, this research was carried out in the midst of Strom Arwen, with snow and flooding hitting areas in Scotland.

Once again, there was variation in experiences by gender and age:

- Women were more likely than men to have experienced heatwave causing discomfort from or being unable to sleep (52% vs 44%).

[28] Howarth, C. et al (2020. https://arro.anglia.ac.uk/id/eprint/705252/6/Howarth_et_al_2019.pdf
[29] Understanding Risk Research Group, 2020. http://orca.cf.ac.uk/129452/1/resilrisk-FINAL-ONLINE.pdf

- 25-34 year olds had higher than average experience of: extreme snow causing travel disruption (84%), heatwave making it hard to sleep (71%) or affecting health (20%), flooding in local area (61%), restrictions on food supplies (46%), and flood damage to the home (12%).

Disruption to travel or working due to extreme snow was more common in urban than rural areas (74% vs 65%). Other impacts were also higher than average in:

- Glasgow – heatwave causing discomfort (61%), affecting health (22%), and causing disruption to travel (20%), flood damage to home (11%), and relocation due to flood risk or erosion (11%);
- Highlands and Islands – wildfires (17%);
- Lothians – heatwave affecting health (15%), flood damage to home (9%); and
- Central Scotland – extreme snow causing travel disruption (84%).

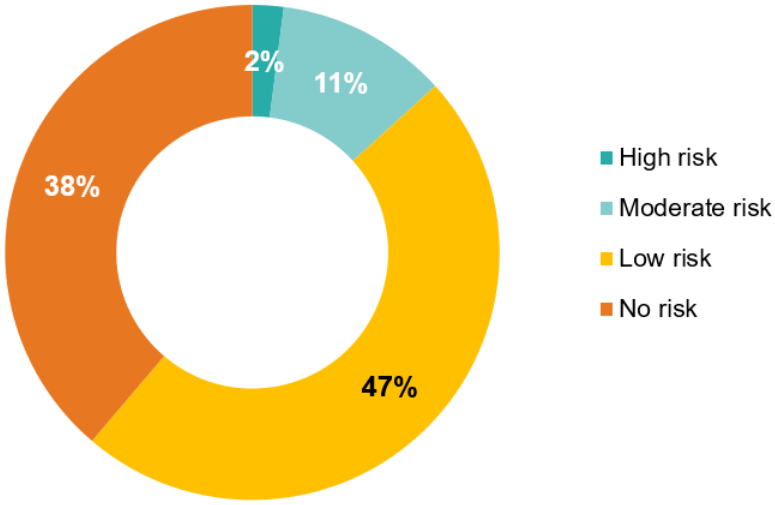
3.3.2 Flood risk

The Scottish Government estimates that 284,000 properties (homes and businesses) in Scotland are at risk of flooding. This figure is expected to increase to 394,000 by 2080 as a result of climate change.[30]

Most survey respondents (85%) considered their homes to either be at a low or no risk of flooding, while 14% felt they had at least a moderate risk. (Figure 3.5).

Figure 3.5 – Perceived flood risk

Q. Thinking about your own home, to what extent do you feel it is currently at risk of flooding?



Base: All respondents (967)

Glasgow was the area where perceived flood risk was highest (20%), while it was lowest in Central Scotland (5%). Perception of flood risk was also higher among younger respondents (25-34 years old) (24% said at least a moderate risk).

Findings suggest that perceptions of flood risk were not always driven by previous experience: 56% of those that has experienced flooding damage to their home felt their home was at flood

[30] The Scottish Government 2019, *Living with flooding An action plan for delivering property flood resilience in Scotland* https://www.gov.scot/publications/living-flooding-action-plan-delivering-property-flood-resilience-scotland/documents/

risk, but 44% did not. Similarly, 23% of those that had experienced flooding their local areas felt their home was at flood risk, while 77% did not.

This apparent disconnect between experience and perceived risks is reflected in findings from previous research carried out by Ipsos MORI for ClimateXChange[31] on Property Flood Resilience (PFR) measures. That study found that, even when people were aware of their property's flood risk, they struggled to accept it as an ongoing risk and perceived resilience measures as irrelevant to their own property. It highlighted the need for general awareness raising pre-flood in areas at risk to shift attitudes towards greater risk awareness and acceptance, combined with targeted communication campaigns and signposting at the crisis stage immediately after a flood.

SEPA research in December 2018[32] found 60% of Scottish homeowners surveyed knew it was their responsibility to protect their own property from flooding, and more than half knew to contact SEPA for flood warning information. However, stakeholder interviews for the current research indicated that there was significant room for improvement in terms of how flood risks are effectively communicated to public audiences. Workshops with Aberdeen Local Resilience Planning Groups (LRPGs), for example, revealed a number of challenges[33] which impeded the group in utilising the skills, knowledge, and resources that its members possessed to build community resilience to climate change and other environmental and social risks. Particular areas of concern noted in the workshops included the lack of a direct link being consistently made between climate change and natural hazards, and climate change narratives not generally being articulated or prominent (but a strong desire to create a narrative of hope and possibility within the communities).

3.4 Lessons for future public engagement

The findings above provide some important signposts towards more effective public engagement.

Firstly, the perception of different events becoming more common was higher among those that were concerned about climate change, felt their concern about climate change had increased, had personal experience of extreme weather, and felt that Scotland was already feeling the effects of climate change. This underscores the importance of 'joining the dots' in government and civil society communications with public audiences - where people can connect their own experiences of extreme weather explicitly to climate change (building the 'ownership' of this experience discussed in Chapter 2), it will be much easier to engage them on future climate risks and ultimately adaptation policies.

The survey supports growing evidence of the link between the experience of extreme weather and engagement with climate change, but also underscores that the link is conditional on people's subjective interpretation of a given event as being driven by climate change. This point is made both in the published literature. For example, in a paper[34] using survey data gathered in the aftermath of severe flooding across the UK, personal experience of this flooding only predicted perceived threat from climate change, and a willingness to engage in behavioural responses, among individuals who subjectively attributed the floods to climate change), and in practical stakeholder experiences (e.g. comments made by one of the stakeholders for this research, contrasting the reactions of residents in island communities in Scotland who are explicitly linking changes in the weather to climate change, with those in Glasgow who may see

[31] Ipsos for ClimateXChange, 2021 https://www.climatexchange.org.uk/media/4756/understanding-the-barriers-to-uptake-of-property-flood-resilience-pfr-in-scotland-may-2021.pdf

[32] https://media.sepa.org.uk/media-releases/2018/scotland-urged-to-be-prepared-for-festive-season-flooding.aspx#_ftn1

[33] Helen Baxter. Creating the Conditions for Community Resilience: Aberdeen, Scotland—An Example of the Role of Community Planning Groups. Int J Disaster Risk Sci (2019) 10:244–260

[34] Charles A. Ogunbode, Christina Demski, Stuart B. Capstick, Robert G. Sposato. (2019). Attribution matters: Revisiting the link between extreme weather experience and climate change mitigation responses. Global Environmental Change 54 (2019) 31–39

more proximal causes such as blocked drains for worsening flooding in the city. Public engagement messaging therefore needs to more closely link increases in people's experience of extreme weather events in Scotland (e.g. Storm Arwen, or the so-called 'beast from the east') to climate change in government communications.

Secondly, there is a noteworthy discrepancy between the level of concern about certain heat-based risks (heatwaves and drought) expressed by participants in this survey compared to previous GB-wide exercises (e.g. RESiL RISK which showed a much higher level of concern about heat impacts) and also a discrepancy between the limited number of people concerned about heatwaves as a climate impact vs the significant proportion of the Scottish public that has experienced a negative impact of heat extremes (sleep disruption). In Scotland there is a need to broaden people's conceptualisation of climate risks from storms and floods so that it includes heat impacts too. One way of leveraging existing perceptions to achieve this might be to refer in engagement messages to one of the most widely shared experiences reported by Scottish survey participants: heatwaves causing discomfort or being unable to sleep (49%). If half of the country can identify with this negative experience, it may be the right place to start a conversation about the heat impacts of a changing climate in Scotland. Other advice (from Climate Outreach) for engaging around heat impacts and/or drought includes[35]:

- The timing of heat/drought communication engagement is important - immediately before, during and immediately after periods of hot weather people are likely to be more receptive to messages around heat extremes. This stands in contrast to engaging around flooding (which can be acute and traumatic), where conversations are better held not during the period of extreme weather itself.

- Emphasise extreme heat/drought as signs of a more volatile climate - this can help people to accommodate both floods/storms and heat extremes in their 'mental model' of what climate impacts look like (rather than then seeming to contradict each other).

- Consider emphasising the health consequences of heat events for the elderly and the very young - especially for those in urban areas, there are relatable experiences to highlight around the risks of overheating on public transport, or in poorly ventilated offices or households.

Thirdly, there are some important findings that bear on engagement around flood risks - specifically that previous experience of flooding does not necessarily mean a heightened level of engagement with future flood risks. The discussion above on the need for government communications to 'join the dots' between extreme weather and climate change is relevant here. But other relevant best-practice communication/engagement advice from Climate Outreach on flood risks includes[36]:

- Communication and engagement around flood events must be carried out sensitively, or they will backfire - people may take time to recognise that they are at greater risk of future flooding.

- Flooding and climate impacts cannot be separated from the wider social context that determines communities' ability to cope with stress and trauma - seeing the 'big picture' on flooding and vulnerability to climate impacts is crucial.

- Communities that have been affected multiple times offer powerful opportunities for learning for other citizens, but they also have a right to 'forget' so should not be pressured into becoming a symbol of flooding/extreme weather.

- Communications should empower people to respond and adapt to future flood risks - focusing on preparedness and support rather than 'getting back to normal' (which may not be possible in a changing climate).

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[35] Climate Outreach, 2016 https://climateoutreach.org/reports/communicating-drought-risk/

[36] Climate Risk, 2015 https://climateoutreach.org/reports/communicating-flood-risks-in-a-changing-climate/

4 Impacts on the natural and built environment

This chapter looks at awareness of impacts of climate change on the natural and built environment and perceived seriousness of these impacts for both Scotland and local areas. Survey respondents were presented with a list of seven risks to the natural environment and seven risks to the built environment and infrastructure and asked for their awareness of and the perceived seriousness of each one.

4.1 Awareness of impacts on the natural environment

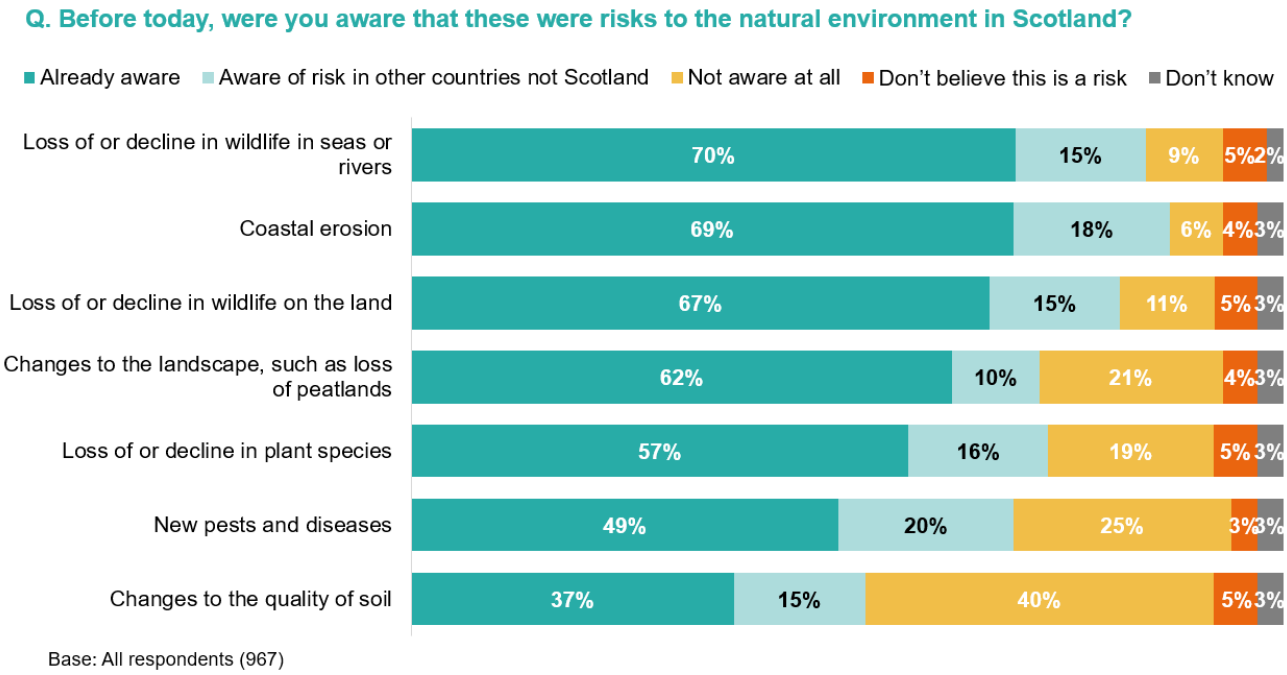
- **Awareness of risks to the natural environment was generally high, with the most well-known risks being coastal erosion and threats to wildlife.**
- **The least well-known risks were changes to soil quality and introduction of new pests and diseases.**

In terms of risks to Scotland, the most well-known were loss of or decline in wildlife in seas or rivers (70%), coastal erosion (69%), and loss of or decline in wildlife on the land (67%). These were followed by changes to the landscape such as loss of peatlands (62%) and loss or decline of plant species (57%).

Overall awareness was lowest in relation to changes to the quality of soil (40% were not aware at all), and new pests or diseases (25% unaware).

For each risk, the proportion saying they were aware of the risk to Scotland was higher than those saying it was more of a risk for other countries. Few (no more than 5%) said they did not believe in these risks to the natural environment at all. (Figure 4.1).

Figure 4.1 – Awareness of risks to the natural environment in Scotland



Base: All respondents (967)

There was some variation in awareness of these risks by age, location and education level:

- 25-34 year olds were more likely than average to be aware of risks to wildlife on the land in Scotland (78%), new pests and diseases (60%) and changes in soil quality (51%).
- The risk of changes to the landscape, such as loss of peatland, was more well-known among those in rural (72%) and urban (59%) areas.
- Awareness of each risk was higher among those educated to degree level and lower among those with no formal qualifications. It was also lower in the most deprived areas.

Overall awareness was also higher among those concerned about climate change, those saying that Scotland was already feeling its effects, and those with personal experience of extreme weather.

4.2 Seriousness of risks to the natural environment

- **Views on the seriousness of risks to the natural environment varied, and risk was more likely to be seen as a problem for Scotland than for the local areas.**
- **Loss of or decline in wildlife was seen as the most serious risk both to Scotland and local areas.**

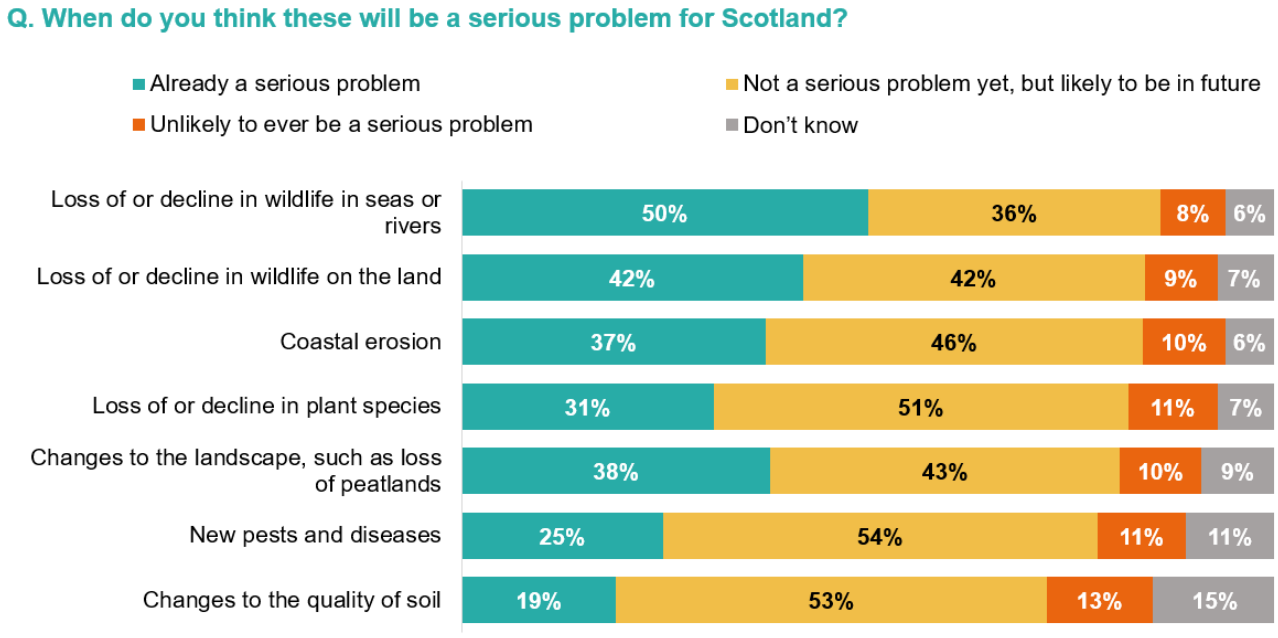
4.2.1 Scotland

There were mixed views on the seriousness of risks to the natural environment in Scotland. Threats to wildlife were viewed relatively more seriously than others, with risk to wildlife in rivers and seas seen as already a serious problem by 50%, and risk to wildlife on the land by 42%.

Just over a third said changes to landscape (38%) and coastal erosion (37%) were already serious problems. Other risks – threats to plant species, new pests or diseases, and changes to soil quality - were viewed more as future problems, with around half saying these were not problems yet but likely to be in future.

The proportion saying these risks were unlikely to ever be a problem for Scotland was relatively low, ranging from 8-13%. (Figure 4.2).

Figure 4.2 – Seriousness of risks to the natural environment in Scotland



Base: All respondents (967)

Variation in views echoed much of the pattern seen earlier, with difference by age, gender and education level:

- Belief that risks were already a problem in Scotland tended to be higher among younger people (16-34 years old) and those educated to degree level.
- Older respondents (65-74) were more likely to view some risks as not yet a serious problem but likely to be in future.
- Men were more likely than women to say that these impacts on the natural environment were unlikely to ever be a problem in Scotland.

4.2.2 Local areas

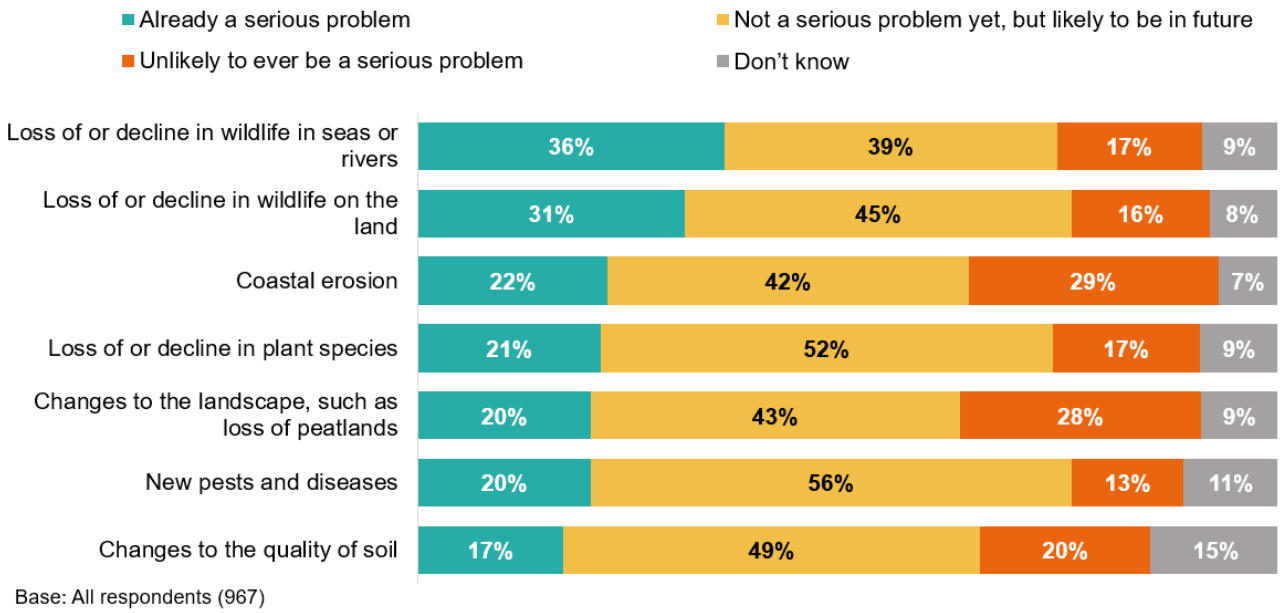
It should be noted, again, that when respondents were asked about natural environment risks in "the area you live in", this area was not defined and was open to respondents' own interpretation.

Risks to the natural environment were seen more as Scotland-level than local-level problems. The top two risks for local areas were loss or decline of wildlife in rivers and seas (36% said this was already a serious problem) and wildlife on land (31%). Around a fifth considered the other risks to be serious problems for their area: coastal erosion (22%), loss or decline in plant species (21%), changes to the landscape (20%), new pests and diseases (20%), and changes to the quality of soils (17%). Overall, each risk was more likely to be seen as a future problem than a current problem for the local area.

The proportion saying these risks were unlikely to ever be a problem for their area ranged from 13% for new pests and diseases, to 28% and 29% for changes to the natural landscape and coastal erosion respectively (Figure 4.3).

Figure 4.3 – Seriousness of risks to the natural environment in local areas

Q. When do you think these will be a serious problem for the area you live in?



Base: All respondents (967)

Certain natural environment risks were seen as more serious problems in some areas than others:

- South Scotland - wildlife in seas and rivers (46%),
- Lothians - loss of plant species (30%), and
- Highlands and Islands - changes to the landscape (33%).

As seen in relation to Scotland overall, men were more likely than women to say each risk was unlikely to be a problem. Those aged 16-34 and those with a graduate degree were again more likely than average to feel that some risks were already serious problems.

Perceived seriousness (for both Scotland and the local) was also higher among those concerned about climate change, believing Scotland was already feeling the effects, and with personal experience of extreme weather impacts.

4.3 Awareness of impacts on the built environment

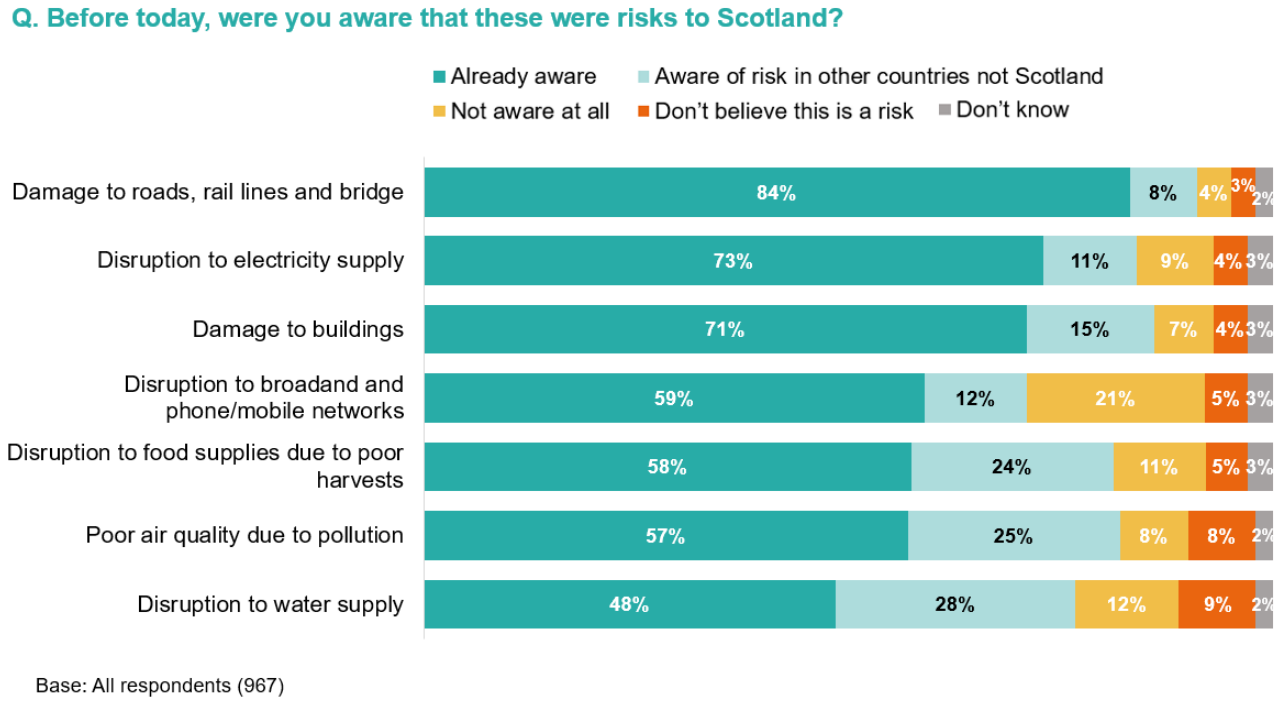
- **Awareness of risks to the built environment and infrastructure in Scotland was generally high.**
- **The most well-known risks were damage to roads, rails and bridges, disruption to electricity supply and damage to buildings.**

In relation to risks to Scotland specifically, the most well-known were damage to roads, rail lines and bridges (84%), disruption to electricity supply (73%) and damage to buildings (71%). These were followed by disruption to broadband and phone/mobile networks (59%), disruption to food supplies due to poor harvests (58%), poor air quality due to pollution (57%) and disruption to water supply (48%).

For each, the proportion saying they were aware of the risk to Scotland was higher than those saying it was more of a risk for other countries. However, risks that were most likely to be seen as issues for other countries were disruption to water supply (28%), poor air quality due to pollution (25%) and disruption to food supply (24%).

Overall awareness was lowest in relation to disruption to broadband and phone/mobile networks, with 21% saying they were not aware of this risk to either Scotland or other countries. (Figure 4.4).

Figure 4.4 – Awareness of risks to the built environment in Scotland



Base: All respondents (967)

Awareness levels varied by location:

- Respondents in Glasgow and Central Scotland were more aware than average of the risks of air pollution in Scotland (72% and 69% respectively)

- Those in rural areas were more aware than those in urban areas of the risk of potential disruption to electric supply in Scotland (83% vs 70%) and to mobile phone or broadband networks (72% vs 56%).
- Those in the most deprived areas had lower than average awareness of risks to roads/rail/bridges, damage to buildings from extreme weather, and disruption to food supply.

Overall awareness of risks to Scotland was also higher among women, those educated to degree level, home-owners, those aged 16-34 and those with high concerns about climate change and personal experience of extreme weather.

4.4 Seriousness of risks to the built environment

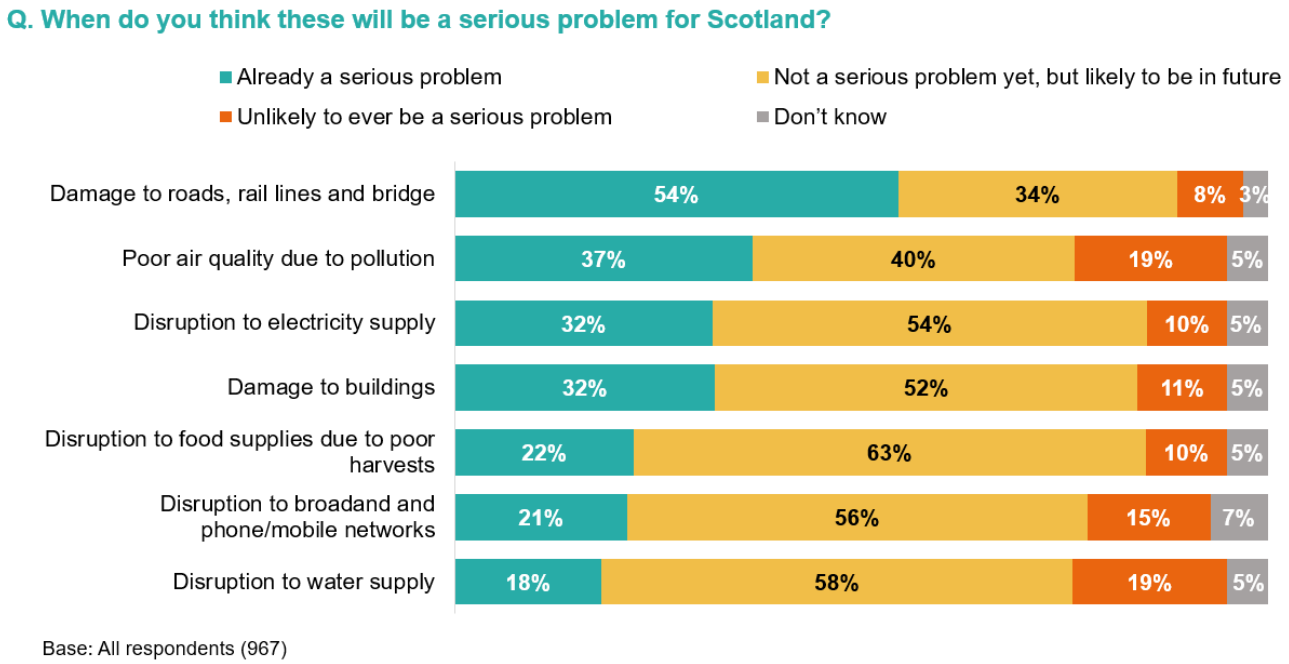
- **Risks to the built environment and infrastructure were generally considered problems for the future rather than serious problems now.**
- **Damage to roads, rail and bridges was seen as being relatively more serious than other risks.**

4.4.1 Scotland

Of the risks to the built environment asked about, damage to roads, rail lines and bridges was viewed most seriously (54% said this was already a serious problem for Scotland). Around a third felt that poor air quality (37%), disruption to electricity supply (32%) and damage to buildings (32%) were already serious problems. Around one in five felt the other risks were serious problems for Scotland- disruption to food supplies due to poor harvests (22%), disruption to broadband and phone/mobile networks (21%), and disruption to water supply (18%).

Overall, most risks were seen as future problems more than current problems. Around one in five felt that poor air quality (19%) and disruption to water supply (19%) were unlikely to ever be serious problems for Scotland, while around one ten felt this way about the other risks. (Figure 4.5).

Figure 4.5 – Seriousness of risks to the built environment in Scotland



Base: All respondents (967)

Those aged 65-74 were less concerned than average about a number of risks: poor air quality (29% said this was unlikely to ever be a problem) disruption to water supply (27%), disruption to mobile networks/broadband (22%), and damage to buildings from extreme weather (16%).

Other patterns reflected those seen earlier, with perceptions of seriousness higher among women, home-owners and those with higher concerns about climate change.

4.4.2 Local areas

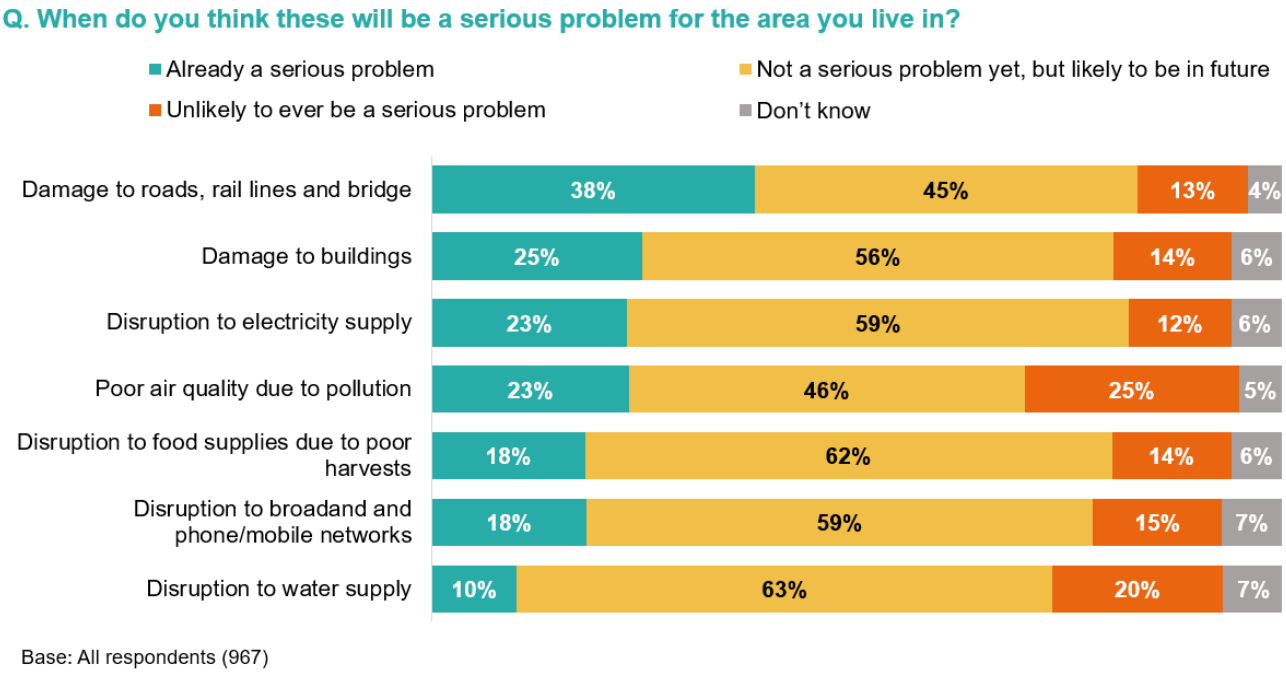
In line with previous patterns for weather events and impacts on the natural environment, respondents were less likely to see impacts on the built environment as a serious problem for their area (which was undefined in the survey) compared to Scotland as a whole. The top issue was still seen as damage to roads, rail lines and bridge (38% said this was already a serious

problem for their area) followed by damage to buildings (25%) and disruption to electricity supply (23%) (Figure 4.6).

Smaller proportions said disruption to food supplies due to poor harvests (18%), disruption to broadband and phone/mobile networks (18%), and disruption to water supply (10%) were already serious problems for their area.

The proportion saying each of these risks were unlikely to ever be a problem for Scotland ranged from 12% (disruption to electricity supply) to 25% (poor air quality).

Figure 4.6 – Seriousness of risks to the built environment in local areas



Base: All respondents (967)

Certain risks were seen as more serious problems in some areas than others:

- Glasgow and Lothian – poor air quality due to pollution (42% and 35%), and
- Highlands and Islands - disruption to electricity supply (35%) and to mobile networks/broadband (31%), a finding supported by the stakeholder interviews conducted for this project which pointed to the risk of losing 'connectivity' (physical and digital) as a particular concern for communities in the Highlands and Islands.

As well as variation by gender and attitudes to climate change, which showed a similar pattern to those seen elsewhere in this report, some further differences emerged:

- Private renters were more likely to view disruption to mobile networks/broadband as a current problem (34%).
- 65-74 year olds were more than likely than average to feel their area would never have a problem with disruption to poor air quality (38%), water supply (31%), disruption to mobile networks/broadband (23%), and damage to buildings from extreme weather (18%).

4.5 Lessons for future public engagement

Some risks to the natural and built environment are widely recognised by the Scottish public, including a cluster of marine/wildlife issues (including coastal erosion) and disruption to transport networks and electricity supplies (from extreme weather). However only a small number of risks were considered particularly serious - with only declining wildlife in rivers and seas, and disruption to rail and road networks, attracting concern from more than half of the Scottish public.

This suggests there is a journey on which the Scottish public can be taken around risks to the natural/built environment, but that it is not currently advisable to assume widespread concern

about most of these risks (even if they are salient). By starting this journey at the points of existing connection with the Scottish public - declining marine/river wildlife, and road/rail network disruption - a story can be told about climate impacts in Scotland that incorporates other natural/build environment risks, but grounded in issues where there is already widespread public concern.

One point to note from the stakeholder interviews conducted for this project is that lots of built infrastructure (e.g. roads) is protected by natural rather than 'manmade' defences - so supporting and strengthening these natural defence is important for the built environment too (a message that could be included in government communications on this topic).

5 Adapting to climate change impacts

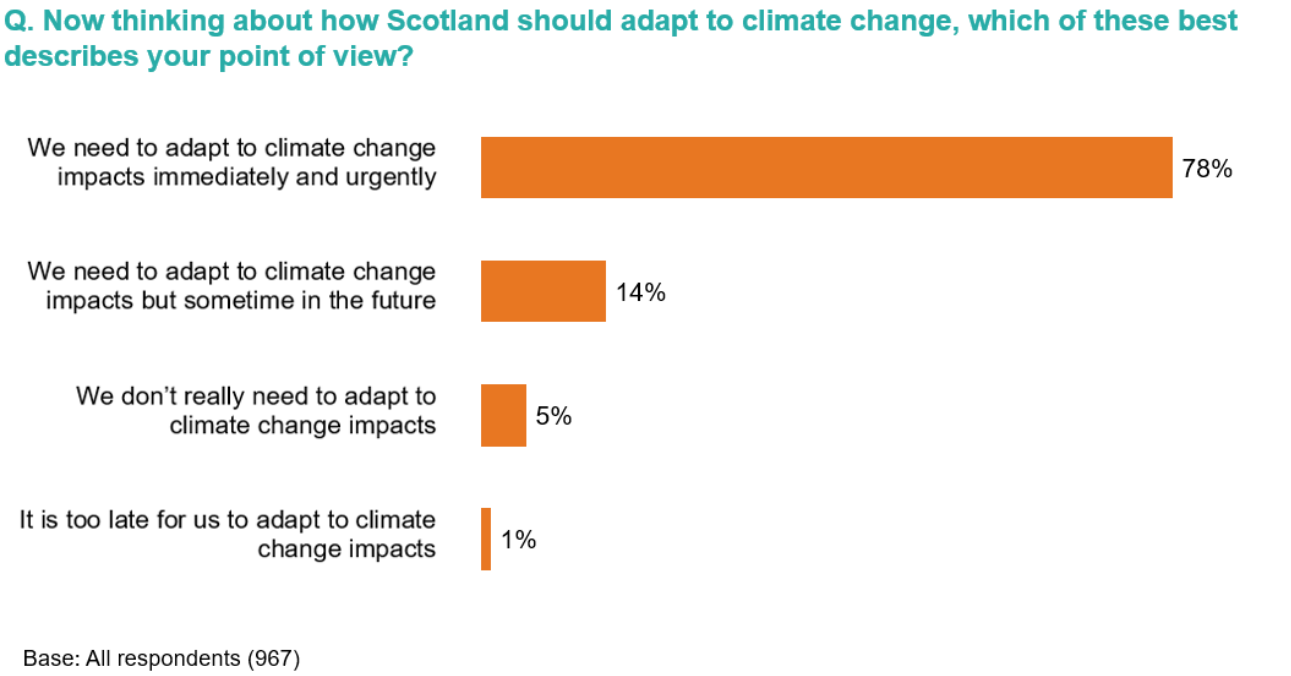
This chapter looks at attitudes towards adaptation to climate change. It includes views on the overall importance of taking action, the perceived efficacy of individual and household actions, and where the public feel responsibility for adapting to climate change impacts should lie. It then looks at awareness of and likelihood of taking a range of adaptation measures.

5.1 Importance of adapting to climate change impacts

Most respondents recognised the need for action to adapt to climate change impacts, reflecting the high levels of concern about climate change and belief that Scotland was already feeling its effects.

Just over three quarters (78%) of respondents agreed that we need to adapt to climate change impacts immediately and urgently. A further 14% felt that adaptation was necessary, but sometime in the future. A minority felt there was no need to adapt (5%) or that it was too late for us to adapt (1%). (Figure 5.1).

Figure 5.1 – Importance of adapting to climate change impacts



As might be expected, views on the importance of adapting were linked with concern about climate change: 91% of those that were concerned about climate felt that we needed to adapt immediately and urgently, while 23% of those *not* concerned felt that there was no need to adapt.

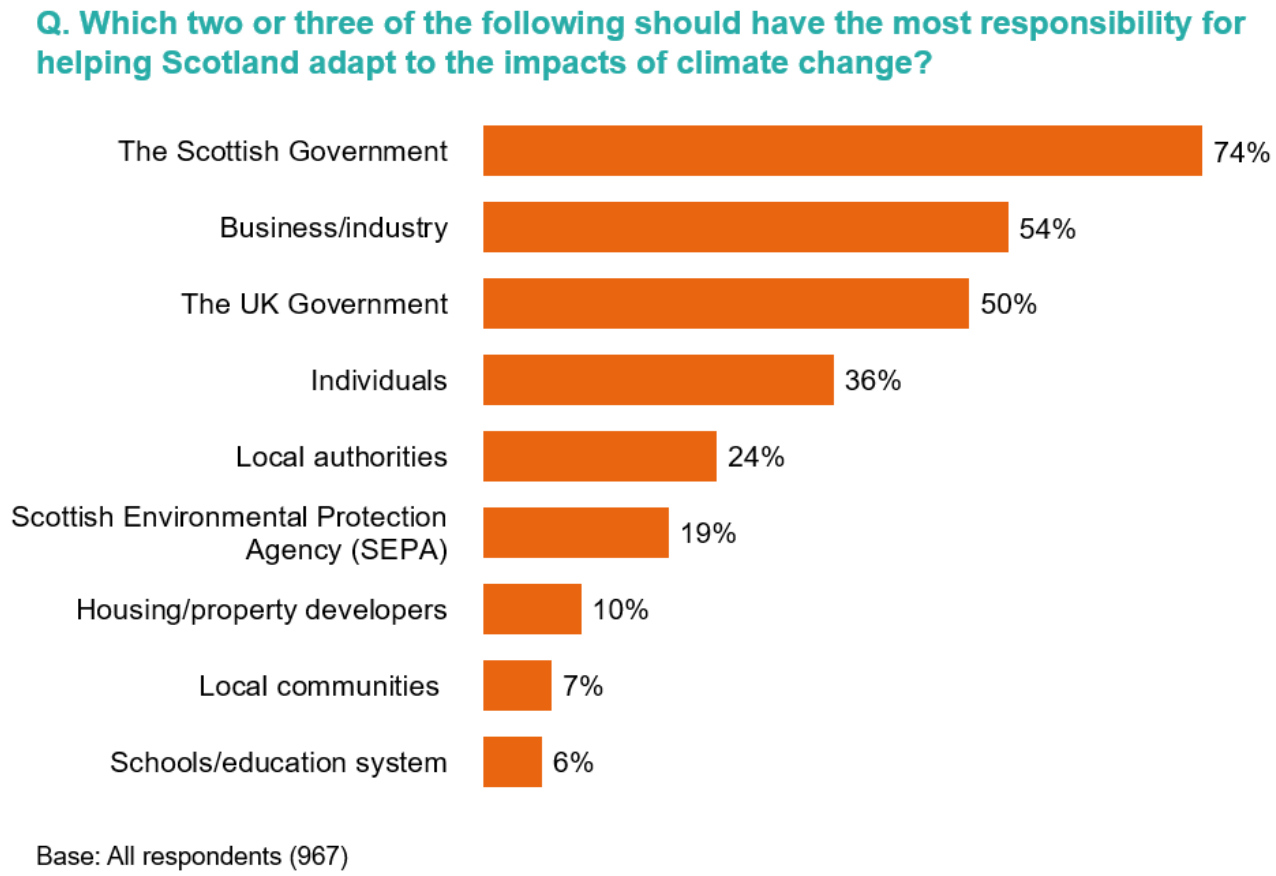
Reflecting their higher levels of concern about climate change risks, belief that we need to adapt immediately and urgently was also higher among 16-34 year olds (88%), those educated to degree level (86%), and those living in Glasgow (90%). Those aged 55 and over were more likely than average to say that we needed to adapt, but sometime in the future (17%).

5.2 Responsibility for adapting to climate change impacts

- **Responsibility for helping Scotland adapt to climate change was seen as resting mainly with government.**
- **Individuals were also seen as having a role, though to a lesser extent than government and industry.**

The Scottish Government were seen as most responsible for helping Scotland adapt to the impacts of climate change (74%), higher than business and industry (54%), the UK Government (50%) and local authorities (24%). Just over a third placed responsibility on individuals (36%). (Figure 5.2).

Figure 5.2 – Responsibility for helping Scotland adapt



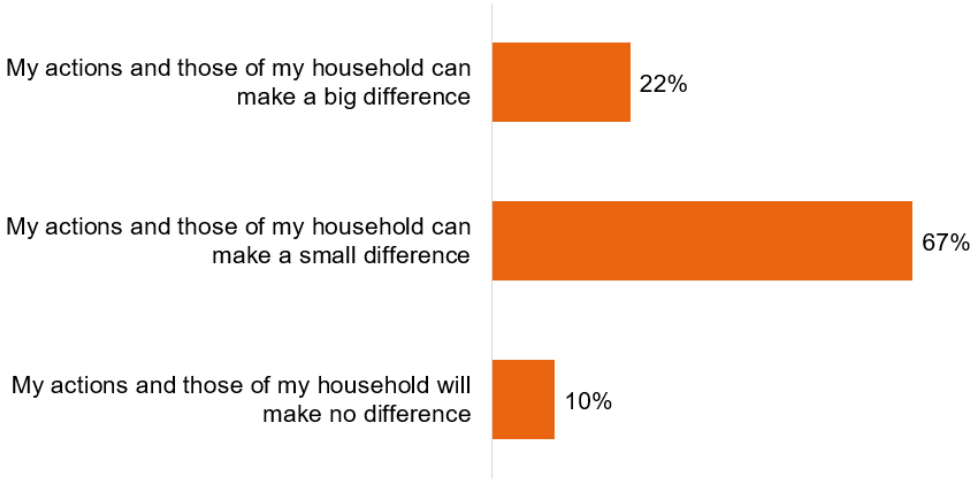
There were some notable differences in perspectives:

- older respondents placed more responsibility on the Scottish Environmental Protection Agency (SEPA) (27% of those 65 and over),
- those in Lothian were more likely to say business/industry (65%), and
- social renters were more likely to say local authorities had the most responsibility (32%).

The majority (89%) felt that their actions, and those of their household, could make a difference in helping respond to climate change impacts – 22% a big difference and 67% a small difference. One in ten (10%) felt their actions would make no difference. (Figure 5.2).

Figure 5.3 – Efficacy of individual and household action

Q. Thinking about how you/your household can help respond to the impact of climate change…?



Base: All respondents (967)

Groups that were most sceptical, believing their actions would make no difference, were men (15% vs 6% of women), those renting from the council or housing association (18%), and those living in Mid Scotland and Fife (20%).

5.3 Actions to adapt to climate change impacts

- **Most respondents had either already taken, or were likely to take, at least one action to help adapt to climate change impacts in future.**
- **The actions most likely to be taken in future mainly related to supporting and helping other people, rather than making physical changes to properties.**

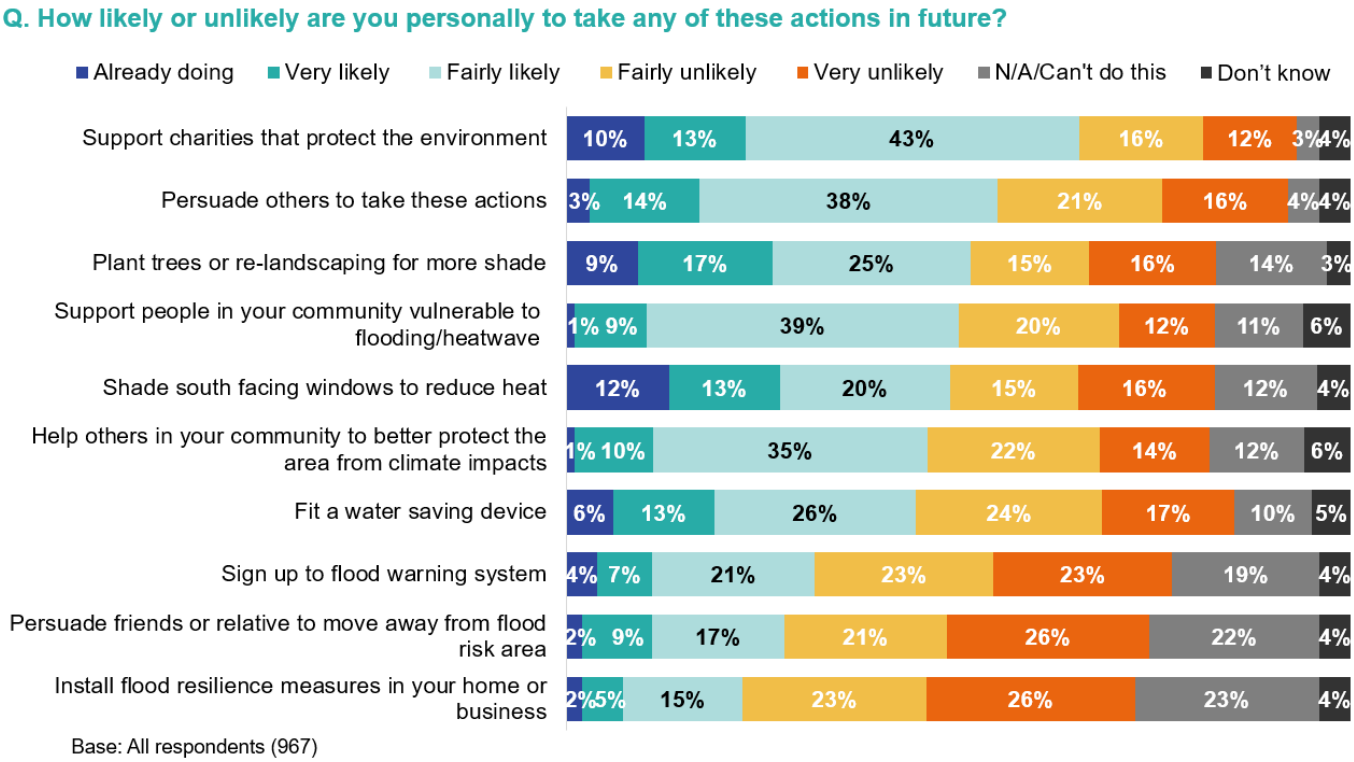
Overall, most respondents intended to take action in future to help adapt – 88% had either already taken or were likely in future to take at least one of the actions listed.

In terms of existing action, 16% had already shaded south facing windows in their home to reduce heat, 9% had planted trees or landscaped for more shade, and 10% supported charities that protect the environment. Lower proportions had fitted a water saving device (6%), signed up to a flood warning system (4%) and persuaded others to take actions (3%). Other actions had been taken by fewer than 3%.

The actions that were most likely to be taken in future related to helping or supporting other people, including supporting charities (55% very/fairly likely), persuading others to take actions (52%), helping support people in the community vulnerable to flooding or heatwave (49%) and helping others in the community protect the area from climate impacts (42%).

Respondents were least likely to say they would install flood resilience measures in their home (50% very/fairly unlikely), sign up to a flood warning system (46%), fit a water saving device (41%), and persuade friends or relatives to move away from areas at risk of flooding (47%). These were also the actions most likely to be seen as “not applicable” or that respondents said they could not do.

Figure 5.4 – Likelihood of taking action to adapt to climate change impacts



Although one in three respondents thought flooding was already a problem for their local area and a further 46% thought it would be in the future, installing flood resilience measures were some of the climate-adaption actions respondents were least likely to take.

Flood-related adaptations were more likely to have been taken by those who perceived their homes to be at flood risk than those who did not. However, some of those who felt their homes were at risk of flooding nonetheless said they were either unlikely to take these measures or that they would not be relevant or possible. These respondents tended to say their homes were at a “moderate” risk of flooding (rather than “high” or “very high”), suggesting that perception of severity of risk was driving their attitudes to adaptation measures.

Table 5.1 – Likelihood of taking flood measures, by perceived flood risk

	Sign up to flood warning system		Install flood resilience measures in your home or business	
	% of those perceiving their homes to be at risk of flooding	% of those not perceiving their homes to be at risk of flooding	% of those perceiving their homes to be at risk of flooding	% of those not perceiving their homes to be at risk of flooding
Already doing	10	3	5	2
Very/fairly likely	52	25	50	16
Fairly/very unlikely	26	50	31	53
N/A / Can’t do	10	20	9	26

Across a range of measures, future intention to take action was higher among 25-34 year olds, but lower among those aged 65 and over. Men were also less likely than women to say they would take actions in future.

In terms of location, likelihood of taking certain actions were higher than average in:

- West of Scotland - flood resilience measures (34%), flood warning systems (43%), helping others in the community protect the area (57%),
- Glasgow – shading south facing windows (48%), and
- Lothian – fitting water saving devices (47%).

5.4 Lessons for future public engagement

More than three quarters of the Scottish public agreed that that we need to adapt to climate change impacts immediately and urgently - although most saw this as the responsibility of the government and industry, rather than individuals. This belief was reflected in a moderate sense of how effective household actions could be in responding to climate risks and enhancing adaptation. Despite this, most of the Scottish public felt they could make a small difference on adaptation and reported at least one 'adaptation behaviour' from the list provided in the survey. Actions tended to lean towards supporting environmental charities and supporting others to make changes, rather than making changes to their own lives or properties.

At a GB-wide level, previous studies suggest that the public show willingness to take action at an individual and community level to adapt to climate change. In the RESiL RISK survey from 2019, very strong support (≥67%) and little opposition (≤8%) was identified for a range of adaptation policies such as regulations on buildings, building new water reservoirs, and spending public money on flood defences. Support for policies that aim to mitigate climate change was more nuanced than that, with some policies (e.g. increasing electricity prices) particularly controversial - suggesting overall, adaptation policies are less contentious than mitigation ones (and support holds up across the political spectrum). However, there was a great deal of uncertainty around climate adaptation actions, with large percentages choosing 'about as likely as unlikely' across the set of adaptation actions asked about.

These findings - broad support but also uncertainty about how effective individual actions can be - mirror the current survey findings and comments from stakeholder interviews, one of which was "there's strong public awareness and support for adapting in the long run, but it's not clear if people understand that near-term adaptation is now unavoidable and urgent". .

Survey findings also provide some lessons for future engagement on flood adaptation measures specifically. A relatively small proportion of respondents who felt their homes were at risk of flooding had already taken action (such as signing up to a flood warning system or installing flood resilience measures), while a sizeable proportion were either unlikely to take those actions or felt they would not be relevant or possible. Previous research[37] highlights the journey that home and business owners need to go on to become more resilient to flooding, the first stages being knowledge that the property is at flood risk and feeling able to take action. Research by Ipsos for ClimateXChange[38] therefore recommends raising awareness of flood risk and property flood resilience, and supporting people so that they feel able to take action. A recent study carried out as part of a PhD Thesis at the University of Leeds included a survey of public perceptions of UK residents on adaptation responses[39]. It argued that individuals might

[37] Oakley, 2018, https://www.floodre.co.uk/wp-content/uploads/2018/03/SMF-Incentivising-household-action-on-flooding_web.pdf
[38] Ipsos for ClimateXChange, 2020 https://www.climatexchange.org.uk/media/4756/understanding-the-barriers-to-uptake-of-property-flood-resilience-pfr-in-scotland-may-2021.pdf
[39] Harcourt, 2020 https://etheses.whiterose.ac.uk/28429/

be more willing to engage in adaptation behaviours as part of a collective (e.g. their community or in partnership with government initiatives), than when asked/expected to be individually responsible, and the Scottish data in the current survey seem to support this: more 'community led' actions (taking part in government-led schemes or neighbourhood-level initiatives) may be more effective starting points for engagement on adaptation with the general public than more individual/household level actions.

A recent analysis[40] of the national policy frameworks around community engagement and resilience in Scotland argued that interconnected issues around local democracy, land-ownership, land prices and land-use planning remain unaddressed, and that tackling these will be key to unleashing the potential of community action -including community-led climate action. People's views of climate risks and their support for adaptation policies, may rest on underlying tensions and socio-economic concerns such as these.

Finally, a meta-analysis (of 106 studies) of the factors that motivate climate change adaptation behaviours, pointed to a number of key influences on people's support for, and undertaking of, adaptation actions[41]. Descriptive norms (i.e. what people see others' doing), negative affect (i.e. experiencing negative emotions like fear or anxiety in relation to climate risks), perceived self-efficacy (i.e. people's sense that what they do matters), and outcome efficacy of adaptive actions (i.e. whether the actions they take are impactful) were most strongly associated with adaptive behaviour. In contrast, knowledge and experience, which are often assumed to be key barriers to adopting adaptation behaviours, were relatively weakly related to adaptation. These findings emphasise the importance of social norms and a sense of efficacy for engaging the Scottish public on adaptation - and messages and narratives should reflect this if they are to be maximally effective.

[40] Philip Revell and Elizabeth Dinnie. Community resilience and narratives of community empowerment in Scotland. Community Development Journal Vol 218 55 No 2 2020 pp. 218–236.

[41] Van Valkengoed, A. M., & Steg, L. (2019). Meta-analyses of factors motivating climate change adaptation behaviour. Nature climate change, 9(2), 158-163.

6 Opportunities arising from climate change

This chapter outlines awareness of potential opportunities presented by climate change for Scotland as well as confidence in individuals, communities and world leaders to come together to adapt to the impacts of climate change.

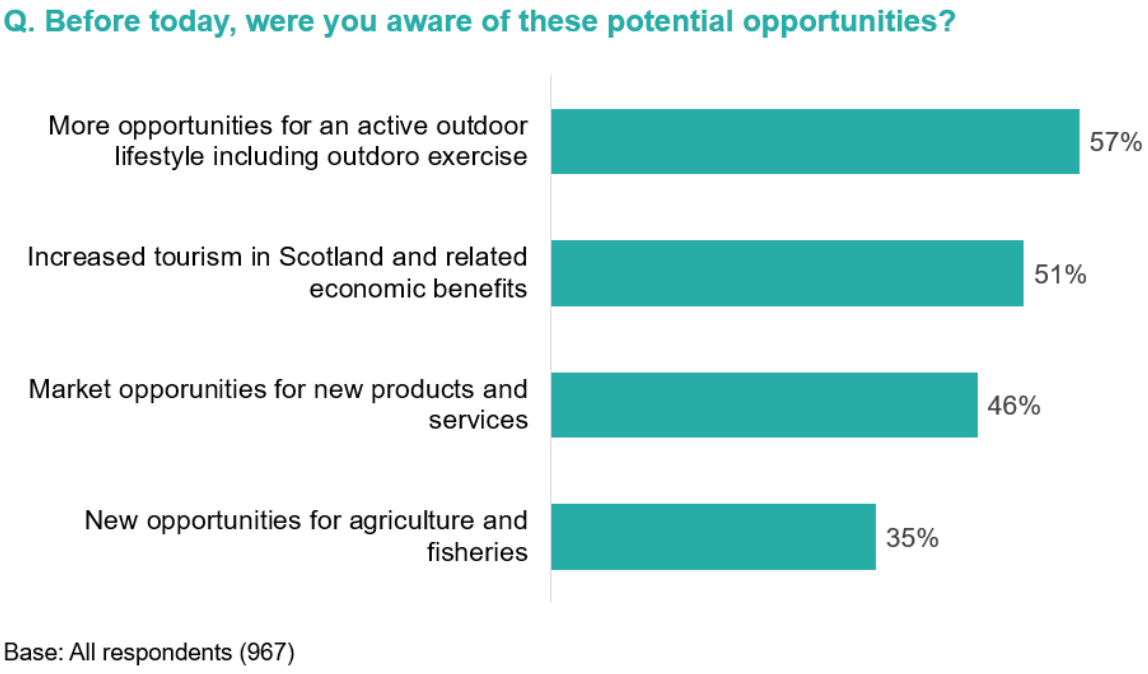
The evidence base for the UKCCRA includes both risks and opportunities from climate change, so it is important that government action both mitigate the risks and harness any potential benefits. It is, however, noted that both the number of climate risks and their predicted impact are much greater than any opportunities arising from climate change.

6.1 Potential opportunities presented by climate change

Awareness of potential opportunities presented by climate change was fairly modest, ranging from around a third aware of new market opportunities, to over half aware of opportunities for a more active outdoor lifestyle.

Over half (57%) were aware that climate change could lead to more opportunities for an active outdoor lifestyle including outdoor exercise. Around half (51%) were aware of the potential for increased tourism in Scotland and related economic benefits, while 46% were aware of new opportunities for agriculture and fisheries and 35% were aware of market opportunities for new products and services (Figure 6.1).

Figure 6.1 – Awareness of potential climate change opportunities for Scotland



People living in rural areas had higher awareness of new opportunities for agriculture and fisheries (42% compared with 33% in urban areas).

Those aged 16-34 and those educated to degree level had higher than average awareness of opportunities for increased tourism (61% and 62%) while the latter group were also more aware of opportunities for an active outdoor lifestyle (69%) and market opportunities (58%).

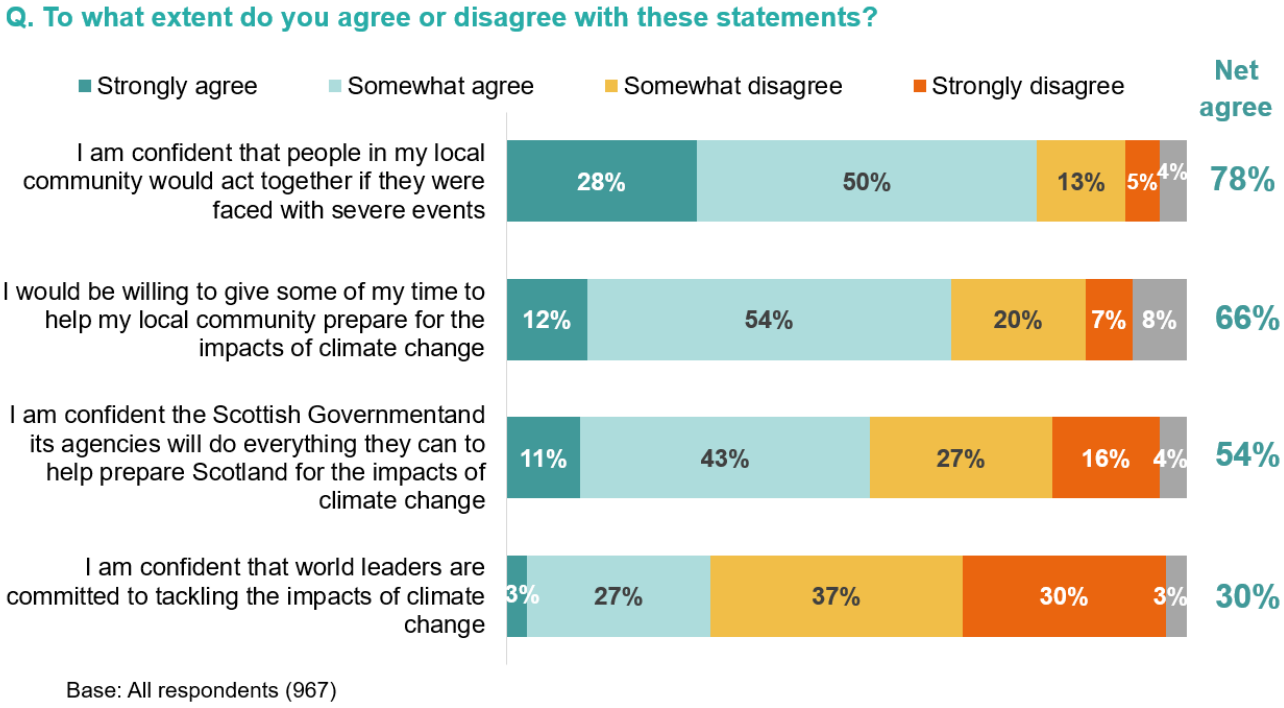
6.2 Confidence in individual, community and government action

While most respondents were confident in their communities and themselves to come together in the face of severe events, there was less confidence in the commitment of Government or world leaders to tackle the impacts of climate change.

Respondents were asked about their confidence in individuals, communities and world leaders to come together to adapt to the impacts of climate change. Over three quarters (78%) were confident that people in their local community would act together if they were faced with severe events (such as flooding or extreme weather) and two thirds (66%) said they would be willing to give up some of their time to help their local community prepare for the impacts of climate change.

There was less confidence in government and world leaders. Just over half were confident that the Scottish Government and its agencies would do everything they could to help prepare Scotland for the impacts of climate change, while only 30% were confident that world leaders were committed to tackling the impacts of climate change (Figure 6.3).

Figure 6.3 – Confidence in different groups to combat impacts of climate change.



Confidence in the local community to act together was higher than average among older age groups (85% of those aged 55 and above), home-owners (81%), those in rural (87%) and the least deprived areas (84%), and those in the Highlands and Islands (90%).

Willingness to help the local community prepare for climate change impacts was higher among 25-34 year olds (80%), graduates (74%), and those with higher levels of concern about climate change and personal experience of extreme weather.

Men (48%) were more likely than women (37%) to *disagree* that they were confident the Scottish Government and its agencies will do everything they can to help prepare Scotland for the impact of climate. Those in the least deprived areas were also more likely (than average) to disagree with this (51%).

6.3 Lessons for future public engagement

It is unclear what role the perceived potential opportunities of climate change in Scotland might have for supporting effective public engagement. On the one hand, there is significant agreement around a small number of issues (especially outdoor recreation) being a benefit of a warmer climate. These should not be ignored, but it would be unwise to place too much emphasis on what - on balance - are a small number of relatively minor benefits set against an array of serious risks. Perhaps the most sensible strategy - reflecting the previous literature on the importance of emphasising the 'co-benefits' of climate policies (e.g. cleaner air, better health outcomes from active transport) - would be to refer to things like increased opportunities for outdoor recreation not as 'opportunities' of changing climate, but co-benefits of adaptation policies (where possible/appropriate).

Reflecting the prevailing trend towards distrust in political (and wider 'establishment' figures) seen repeatedly across GB-scale polling, there is a trust gap for many Scottish citizens around the role of the government in delivering adaptation policies. However, responses to previous questions indicate clearly that the Scottish public expects to see leadership from the government. One interpretation of these findings for public engagement, would be to consider carefully the role of trusted messengers in communicating around adaptation - respected community figures, and people seen as 'peers' to affected communities in some way (e.g. from comparable communities elsewhere) are more likely to command trust than representatives of local or national government.

In a study[42] which analysed data from 51 studies, trust in different types of experts was found to play an important role when it comes to both mitigation and adaptation behaviours, with environmental groups and scientists the actors that matter most for 'private' attitudes and behaviours (e.g. willingness to take out flood risk insurance), whereas trust in national 'institutions' (i.e. government) was more important when it comes to 'public' attitudes and behaviours (e.g. support for adaptation policies).

One approach may be for the Scottish government to position itself as showing institutional leadership and leading on national policies, whilst supporting/funding others (in this survey, local communities and the organisations that represent them) to spearhead communications around more individual/household level adaptation actions. This represents a 'show by doing' type of leadership, rather than positioning government communicators as the loudest voices in engagement around climate impacts and adaptation.

[42] Viktoria Cologna & Michael Siegrist (2019). The role of trust for climate change mitigation and adaptation behaviour: A meta-analysis

7 Conclusions and recommendations

7.1 Summary of key findings

Echoing recent trends, concern about climate change in Scotland was high and increasing, and a majority felt that Scotland was already feeling the effects of climate change. It was clear, therefore, that most respondents were aware of the existence and severity of the climate emergency.

When asked what the specific impacts on Scotland were likely to be, respondents tended to focus on weather-related impacts, and extreme weather was generally seen as becoming more common in Scotland. Some specific events - flooding, heavy rain/wetter weather, heatwaves/warmer temperatures – were seen as both becoming more common and being related to climate change, signalling high levels of awareness of these types of impacts.

Weather-related events were generally seen as more of a serious problem for Scotland overall than for respondents' local areas, though there were some notable regional differences. For example, heavy rain was seen as more of a problem in Glasgow while wildfires were more of a problem in the Highlands and Islands, reflecting higher experience of these types of weather in those areas. More generally, perceived seriousness of weather-related impacts was linked to personal experience of those events, and most respondents had experienced at least one type of extreme weather impact.

Risks to both the natural and built environment were also more likely to be seen as a problem for the whole of Scotland than for respondents' local areas. Awareness of the risks to the natural environment was generally high, particularly coastal erosion and threats to wildlife. Similarly, awareness of risks to the built environment and infrastructure was high, particularly in relation to damage to roads, rail or bridges.

In terms of addressing the impacts of climate change, respondents generally recognised the need for action to be taken but were fairly moderate about the perceived efficacy of individual or household actions. There was a sense of confidence in collective action, with most feeling that people in their community would come together to act if they were faced with climate change impacts like severe weather. Attitudes towards government action suggest somewhat of a conflict. While respondents were fairly clear in their view that the Scottish Government had most responsibility for preparing Scotland for the impacts of climate change, they were less convinced about whether action would be taken – just over half were confident that the Scottish Government would do everything it could to prepare the country for impacts.

Most respondents had already taken, or planned to take, at least one action to help address the impacts of climate change. The sense of collective action noted above was also seen when thinking about the types of adaptive actions that might be taken – there was a tendency towards actions related to supporting people in their local community, more so than making changes to their properties. Some of this, however, may have been driven by a perception that actions were not relevant or possible for properties.

Concern about climate change and perceived seriousness of risks tended to be higher among some groups. Generally speaking, these were women, younger people (aged 16-34), those educated to a degree level, and home-owners.

Concern about and experience of climate change impacts varied by location. Those living in Glasgow, Lothian, and the Highlands and Islands tended to have higher levels of concern or be more likely to say they had experienced certain types of extreme weather (e.g. heatwaves and flood impacts in Glasgow and Lothian, wildfires in Highlands and Islands)

7.2 Recommendations

Findings from this research point to a number of recommendations for future public engagement on climate risks, impacts and adaptation in Scotland:

1. **Framing communications about climate impacts around the 'shared experience' of extreme weather events that are widely associated with climate impacts** (such as flooding or storms).

These experiences can be used as the basis for crafting narratives about the collective, growing effects of climate change.

2. **Being clear and consistent in government communications about the link between extreme weather and climate change.** The science of 'attributing' weather events to changes in the climate is maturing and becoming more accurate. Public engagement messaging therefore needs to more closely link the increase in extreme weather events in Scotland to climate change, where those links are grounded in scientific analyses.

3. **Drawing on the public's understanding of the connections between experience of extreme weather and climate change impacts** - where people can connect their own experiences of extreme weather explicitly to climate change it will be much easier to engage them on future climate risks and ultimately adaptation policies. However, it is also important to remember that this link is conditional on people's subjective interpretation of a given event as being driven by climate change.

4. **Recognising that the public tend to feel climate change impacts are more of an issue for the whole of Scotland than for their local areas**. Communication on climate impacts can help to raise awareness of the risks to local areas, with messaging tailored to reflect the types of extreme weather and other impacts being experienced, or likely to be experienced, in particular areas.

5. **Building awareness and understanding of heat-based climate risks,** by referring to some of the more widely experienced impacts that people may relate to, such as heatwaves causing people discomfort or being unable to sleep.

6. **For engagement around risks to the natural and built environment, using the topics that the public already see as most serious as the starting point** – namely, risks to wildlife, coastal erosion and road/rail network disruption. Using these as the starting point, a story can be told about climate impacts in Scotland that incorporates other natural/build environment risks, but grounded in issues where there is already widespread public concern.

7. **Drawing on learning from previous research into the factors that motivate climate change adaptation behaviours.** Previous research highlights the importance of social norms (i.e. what other people are doing) and perceived sense of efficacy (i.e. whether actions have an impact) in understanding if and how the Scottish public will engage with climate change adaptation. Public engagement messages and narratives should reflect this if they are to be as effective as they can be.

8. **'Community led' actions are likely to be more effective starting points for engagement on adaptation with the general public than more individual/household level actions.** These types of community led actions include taking part in government-led schemes or neighbourhood-level initiatives.

9. **Consider the role of the Scottish Government in demonstrating leadership around climate adaptation.** In line with many previous studies, this survey shows people expect to see leadership from the government on climate change, but do not necessarily have high levels of trust in political representatives or policy makers. One approach may be to pursue a 'show by doing' approach, whereby the Scottish Government (and its agencies) facilitates the conditions/provides funding for others to have a more visible/vocal presence in public engagement. More highly trusted communicators (see next recommendation) can spearhead communications

10. **Consider the role of 'trusted messengers' in communicating around adaptation.** The Scottish Government could support other climate change communicators (such as local communities, regional initiatives, and the organisations that represent them) to lead on communications/engagement campaigns.

8 Questionnaire

OVERALL CONCERN ABOUT CLIMATE CHANGE AND RISK

Q1. What impacts, if any, do you expect climate change to have in Scotland?

OPEN ENDED QUESTION WITH WRITE IN RESPONSE BOX

Q2. How concerned, if at all, are you about climate change at the moment?

1. Very concerned
2. Fairly concerned
3. Not that concerned
4. Not at all concerned
5. Don't know

Q3. And how concerned are you about the impacts of climate change on Scotland specifically?

1. Very concerned
2. Fairly concerned
3. Not that concerned
4. Not at all concerned
5. Don't know

Q4. Over the last 12 months (since November 2020) has your level of concern about climate change impacts in Scotland increased, decreased, or stayed the same?

1. Increased
2. Decreased
3. Stayed the same
4. Don’t know

Q5. When, if at all, do you think Scotland will be feeling the effects of climate change?

1. We are feeling the effects now
2. In the next 10 years
3. In the next 25 years
4. In the next 50 years
5. In the next 100 years
6. Beyond the next 100 years
7. Never
8. Don’t know

AWARENESS/PERCEIVED SERIOUSNESS OF SPECIFIC CLIMATE CHANGE RISKS

Q6. Do you think the following weather-related events have become more common, less common, or not changed in Scotland in the last few years?

1. Heavy rain and storms
2. Flooding
3. Milder/wetter winters
4. Hotter/drier summers
5. Heatwaves
6. Cold snaps
7. Drought
8. Wildfires

ANSWER OPTIONS

A. Much more common
B. A little more common
C. A little less common
D. Much less common

E. No change
F. Don't know

Q7. When do you think these weather-related events will be a serious problem for Scotland?

1. Heavy rain and storms
2. Flooding
3. Milder/wetter winters
4. Hotter/drier summers
5. Heatwaves
6. Cold snaps
7. Drought
8. Wildfires

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

Q8. And when do you think these weather-related events will be a serious problem for the area you live in?

1. Heavy rain and storms
2. Flooding
3. Milder/wetter winters
4. Hotter/drier summers
5. Heatwaves
6. Cold snaps
7. Drought
8. Wildfires

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

Q9. Have you personally experienced any of these types of extreme weather-related problems?

1. Flooding damage to your home
2. Flooding in your local area
3. Relocation due to flood risk or erosion
4. Extreme snow causing disruption to travel or working
5. Extreme snow causing damage to personal property
6. Heatwave causing discomfort/being unable to sleep
7. Heatwave causing disruption to travel or working
8. Heatwave significantly affecting health
9. Water restrictions/shortages due to low rainfall
10. Restrictions on food supplies due to extreme weather
11. Wildfires during drought periods

ANSWER OPTIONS

A. Yes
B. No
C. Don't know

Q10. Thinking about your own home, to what extent do you feel it is currently at risk of flooding?

1. Very high risk
2. High risk

3. Moderate risk
4. Low risk
5. No risk
6. Don't know

Q11. You will now see a list of changes that are happening, or may happen in future, to the natural environment in Scotland. Before today, were you aware that these were risks to the natural environment in Scotland?

1. Coastal erosion (where the sea wears away the land)
2. Loss of or decline in plant species
3. Loss of or decline in wildlife on the land
4. Loss of or decline in wildlife in seas and rivers
5. Changes to the quality of soils
6. Changes to the landscape, such as loss of peatlands
7. New pests and diseases

ANSWER OPTIONS

A. I was already aware this was a risk for Scotland
B. I was aware this was a risk in other countries, but not Scotland
C. I was not aware of this risk at all
D. I don't believe this is a risk
E. Don't know

Q12. When do you think these changes to the natural environment will be a serious problem for Scotland?

1. Coastal erosion (where the sea wears away the land)
2. Loss of or decline in plant species
3. Loss of or decline in wildlife on the land
4. Loss of or decline in wildlife in seas and rivers
5. Changes to the quality of soils
6. Changes to the landscape, such as loss of peatlands
7. New pests and diseases

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

Q13. When do you think these will be a serious problem for the area you live in?

1. Coastal erosion (where the sea wears away the land)
2. Loss of or decline in plant species
3. Loss of or decline in wildlife on the land
4. Loss of or decline in wildlife in seas and rivers
5. Changes to the quality of soils
6. Changes to the landscape, such as loss of peatlands
7. New pests and diseases

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

Q14. You will now see a list of some other changes that are happening, or may happen, impacting our infrastructure in Scotland. Before today, were you aware that these were risks for Scotland?

1. Disruption to water supply due to drought and/or flooding
2. Disruption to electricity supply due to extreme weather
3. Disruption to broadband and phone/mobile networks due to extreme weather

4. Poor air quality due to pollution
5. Disruption to food supplies due to poor harvests in Scotland and abroad
6. Damage to roads, rail lines and bridges from extreme weather
7. Damage to buildings from extreme weather

ANSWER OPTIONS

A. I was already aware this was a risk for Scotland
B. I was aware this was a risk in other countries, but not Scotland
C. I was not aware of this risk at all
D. I don't believe this is a risk
E. Don't know

Q15. When do you think these changes will be a serious problem for Scotland?

1. Disruption to water supply due to drought and/or flooding
2. Disruption to electricity supply due to extreme weather
3. Disruption to broadband and phone/mobile networks due to extreme weather
4. Poor air quality due to pollution
5. Disruption to food supplies due to poor harvests in Scotland and abroad
6. Damage to roads, rail lines and bridges from extreme weather
7. Damage to buildings from extreme weather

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

Q16. And when do you think these changes will be a serious problem for the area you live in?

1. Disruption to water supply due to drought and/or flooding
2. Disruption to electricity supply due to extreme weather
3. Disruption to broadband and phone/mobile networks due to extreme weather
4. Poor air quality due to pollution
5. Disruption to food supplies due to poor harvests in Scotland and abroad
6. Damage to roads, rail lines and bridges from extreme weather
7. Damage to buildings from extreme weather

ANSWER OPTIONS

A. Already a serious problem
B. Not a serious problem yet, but likely to be in future
C. Unlikely to ever be a serious problem
D. Don't know

ACTIONS TO MITIGATE THESE RISKS AND IMPACTS

Q17. Now thinking about how Scotland should adapt to the impacts of climate change, which of these best describes your point of view?

1. It is too late for us to adapt to climate change impacts
2. We need to adapt to climate change impacts immediately and urgently
3. We need to adapt to climate change impacts, but sometime in the future
4. We don't really need to adapt to climate change impacts
5. Don't know

Q18. And thinking about how you and your household can help respond to the impacts of climate change, which of these best describes your view?

1. My actions, and those of my household, can make a big difference
2. My actions, and those of my household, can make a small difference
3. My actions, and those of my household, will make no difference
4. Don't know

Q19. Which two or three of the following should have most responsibility for helping Scotland adapt to the impacts of climate change? Please select up to three

MULTICODE UP TO 3

1. Individuals
2. Local communities
3. Business / industry
4. Housing / property developers
5. Local authorities
6. The Scottish Government
7. The UK Government
8. Schools / education system
9. The Scottish Environmental Protection Agency (SEPA)
10. Other (please specify)
11. Don't know

Q20. There are a number of actions individuals might take to help adapt to the impacts of climate change. Before today, which of these actions were you aware of?

1. Installing flood resilience measures in your home or business
2. Signing up to a flood warning system
3. Shading south facing windows with a blind to reduce heat
4. Planting trees or re-landscaping garden to provide more shade
5. Fitting a water saving device
6. Helping others in your community to better protect your area from climate impacts (e.g. flooding)
7. Helping to support people in your community who are vulnerable to flooding or heatwave
8. Supporting charities that help protect the environment
9. Persuading friends or relatives to move away from areas at risk of flooding

Q21. How likely or unlikely are you personally to take any of these actions in future?

1. Installing flood resilience measures in your home or business
2. Signing up to a flood warning system
3. Shading south facing windows with a blind to reduce heat
4. Planting trees or re-landscaping garden to provide more shade
5. Fitting a water saving device
6. Helping others in your community to better protect your area from climate impacts (e.g. flooding)
7. Helping to support people in your community who are vulnerable to flooding or heatwave
8. Supporting charities that help protect species the environment
9. Persuading friends or relatives to move away from areas at risk of flooding
10. Persuading others to take any of the actions on this list

ANSWER OPTIONS

A. Very likely
B. Fairly likely
C. Fairly unlikely
D. Very unlikely
E. Have already done/already doing
F. Not applicable/can't do this
G. Don't know

OPPORTUNITIES ARISING FROM CLIMATE CHANGE AND ENGAGEMENT

Q22. Before today, were you aware of any of these potential opportunities that climate change presents for Scotland?

1. More opportunities for an active outdoor lifestyle, including outdoor exercise
2. Increased tourism in Scotland and related economic benefits
3. New opportunities for agriculture and fisheries
4. Market opportunities for new products and services

ANSWER OPTIONS

A. Yes
B. No
C. Don't know

Q23. To what extent do you agree or disagree with the following statements

1. I would be willing to give up some of my time to help my local community prepare for the impacts of climate change
2. I am confident that people in my local community would act together if they were faced with severe events (such as flooding or extreme weather)
3. I am confident that the Scottish Government and its agencies will do everything they can to help prepare Scotland for the impacts of climate change
4. I am confident that world leaders are committed to tackling the impacts of climate change

ANSWER OPTIONS

A. Strongly agree
B. Somewhat agree
C. Somewhat disagree
D. Strongly disagree
E. Don't know

9 Stakeholders interviewed

Representatives from the following stakeholder organisations were interviewed as part of this study:

- Sniffer/Adaptation Scotland
- Scottish Flood Forum
- University of St Andrews
- Nature Scot, Outer Hebrides

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