



# Climate Crisis: Informing Scotland's actionable mitigation and adaptation response to water scarcity

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## Purpose of research

The aim of this project has been to inform and prioritise mitigation and adaptation actions to address future water scarcity challenges in Scotland. The **key questions** to be addressed were:

1. What is the current state of knowledge regarding the past trends, current situation, and future projections of water scarcity in Scotland?
2. What is currently being done to mitigate water scarcity in Scotland and how effective are these strategies?
3. In the future, will these strategies be fit for purpose under different climate change projections and the associated uncertainties?
4. What mitigation and adaptation strategies are therefore needed to address water scarcity in the short and long term in Scotland?
5. How can these proposed strategies be implemented within the current policy framework in Scotland?

## Background

**Water scarcity** is a term used to indicate conditions where access to enough water, of sufficient quality to meet human and ecological needs, has become limited (UN-Water, 2023). Water scarcity can occur when the supply of water becomes less reliable, for example when droughts become more prevalent, and/or when the demand for water increases.

The rate at which Scotland's climate is changing is unprecedented in our history. We are becoming exposed to climate related risks, such as water scarcity, that were not considered significant in the past and have not been planned for. Furthermore, what are currently seen as exceptional conditions, such as the 2018 summer

drought which led to significant negative impacts on aquatic ecology, agricultural production and industry, are projected to become much more frequent by 2050s as a result of climate change (UKCP, 2023). Without a concerted effort to manage Scotland's water resources through this change, those impacts will become more frequent and severe. Through extensive engagement with stakeholders in the water sector this project illuminates our current level of preparedness for water scarcity and makes recommendations to ensure we protect access to our valuable natural water resources and the services they provide.

## Key findings

- Scotland's supply of natural water resource is becoming increasingly variable. There is evidence that meteorological and hydrological droughts have become more frequent in Scotland (Spinoni *et al.*, 2017; EEA, 2020) and this has led to an increased awareness of water scarcity risk amongst those stakeholders engaged with in the project.
- The latest climate change projections indicate that drought conditions in much of Scotland are likely to increase in frequency, severity, and duration over the next few decades (Kirkpatrick Baird *et al.*, 2023).
- There is evidence that water demand in the future may increase in areas, and at times of the year, where supply is projected to decrease. Behavioural responses to the extreme events associated with the climate crisis may serve to exacerbate this if not managed.
- In the opinion of the project's water sector participants there is a strong consensus that water scarcity in Scotland is underestimated generally, and that water is undervalued.

- Some organisations that understand the high cost of water scarcity to their business have comprehensive strategies and plans to address the risk over the long term. However, most have either no plans or plans that only mitigate the worst impacts of a short duration drought.
- There is demand for greater joined-up governance over water scarcity in Scotland including ensuring the links are made with other high priority policy areas such as making a just transition to Net Zero and halting the decline in global biodiversity.

## Recommendations

To mitigate the effects of, and, to adapt to water scarcity this project proposes a series of recommendations for delivery partners, including the Scottish Government,

in the areas of Governance, Management and Behaviour Change (Figure 1).

The project has also outlined key research activities which will directly address the knowledge gaps and challenges identified by water sector stakeholders. These knowledge gaps include but are not limited to: understanding the potential for water use efficiency and the efficacy of demand-side responses; research to understand the implications of climate change for environmental flows and ecosystem resilience; and work to stress test existing and potential water scarcity plans across sectors under different climate change projections. By acting now to address the long-term risk of water scarcity we can not only protect our valued water sector but allow it to realise future opportunities and establish Scotland as an exemplar of sustainable water resource management.

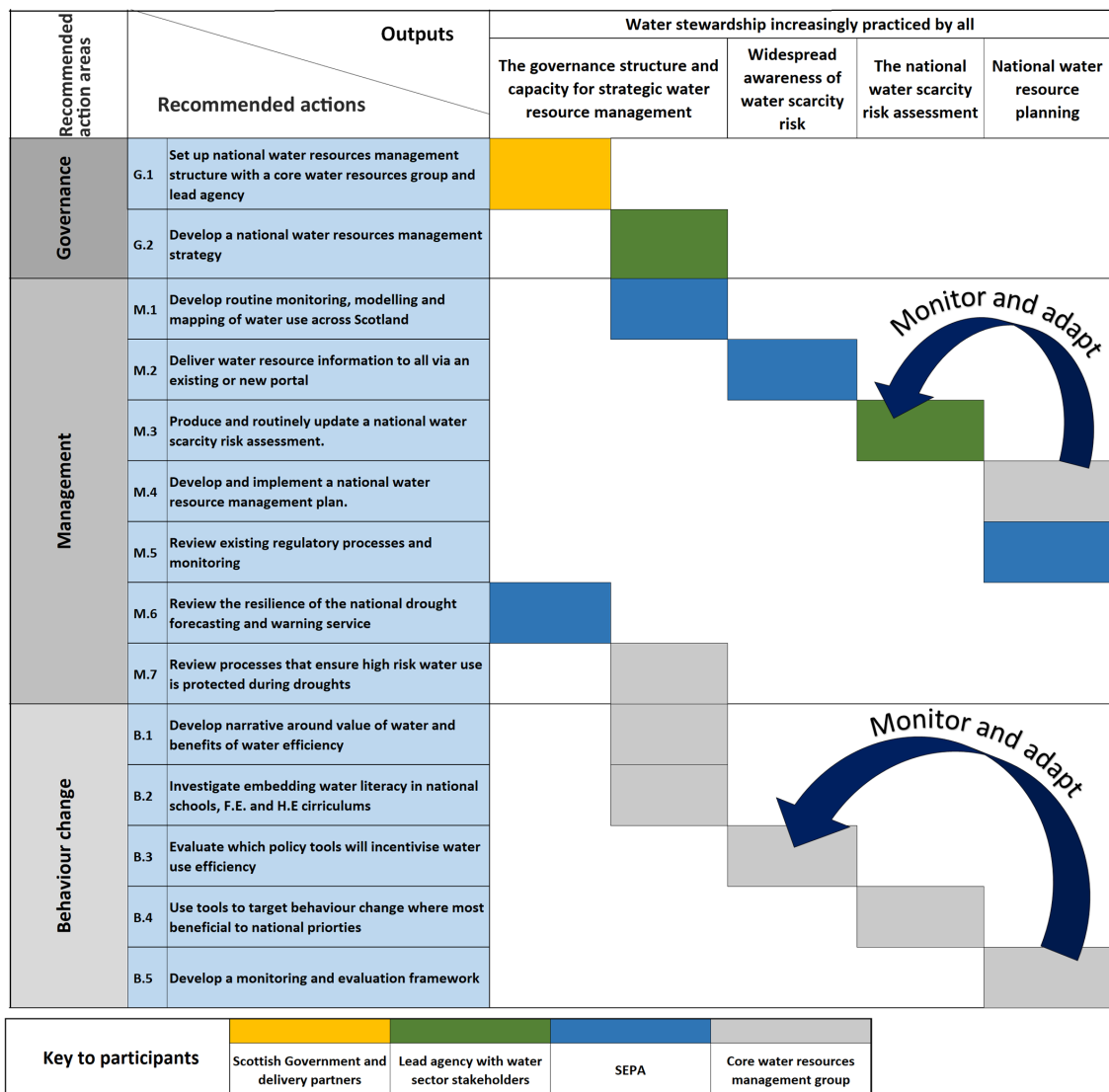


Figure 1: The recommended action plan.

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To access the main report for this project, please visit: [crew.ac.uk/publication/mitigation-adaptation-response-to-water-scarcity](http://crew.ac.uk/publication/mitigation-adaptation-response-to-water-scarcity)