Water insecurity in unexpected places

Risks and concerns perceived by Private Water Supply (PWS) users in rural Scotland

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Introduction

PWS are self-managed sources (e.g. springs, boreholes, lochs) and treatment systems managed by owners or users. There are 22k PWS supplies in Scotland of which ~18K are unregulated (no formal oversight by Local Authorities). We know that they can be vulnerable to various forms of water insecurity:

- **Water quantity**: Water scarcity affects PWS in dry periods (e.g. Holdsworth 2019; Rivington et al. 2020)
- **Water quality**: Poor for some PWS (CAS 2020, DWQR 2022)
- **Supply reliability**: Unprepared for climate change impacts (Valero et al. 2022, Scottish Government 2022)
- **Affordability**: Upgrading to more reliable supplies can be costly, and mains connection is not always possible (Scottish Water; CAS 2020; Teedon et al. 2020)

We explored household vulnerability to water insecurity using a Scotland-wide survey, focusing on differences between the north-east (Aberdeenshire, Moray) and SW (Dumfries and Galloway, Ayrshire). These are both areas with high numbers of PWS but having different land-use and climatic characteristics.

Initial findings have been shared with relevant stakeholders, and reducing PWS users' vulnerability is relevant to ongoing Scottish Government policy development.

Methods

We conducted an **online survey of households using PWS** between December 2023 and May 2024. We sought coverage from across Scotland via Local Authority contacts and social media, focussing effort in the NE and SW given the high numbers of unregulated supplies in these regions.

We asked PWS users about their experience and perceptions of risk relating to their PWS. We wanted to understand their perception of their supply's vulnerability in relation to drought, contamination, and other impacts, alongside treatment measures and associated costs.

The questionnaire was built on insights from reports (e.g. DWQR, CAS) and related research (e.g. Mooney et al 2022, Malecki et al 2017). Topics included:

- Household characteristics
- Households' PWS infrastructure
- Impacts experienced, and users' responses
- Perceptions of risks
- Regulatory and technical support

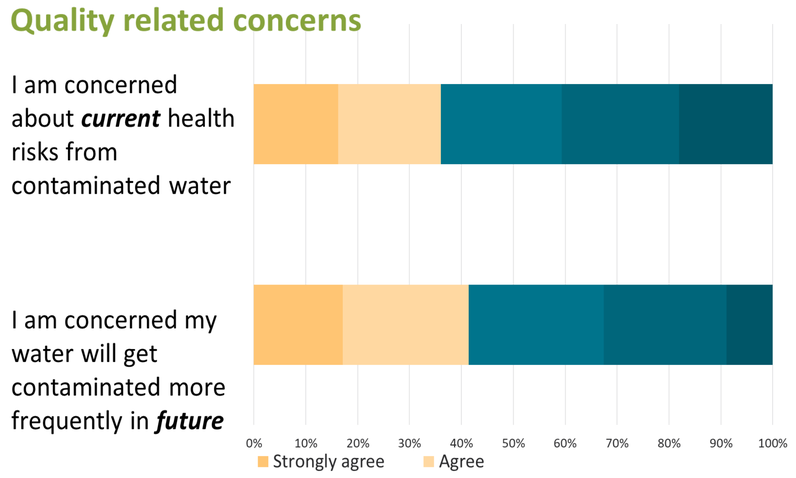
Background information about this study :

Further insights:

Results

We received 185 responses (red pins) of which 91% were on unregulated supplies.

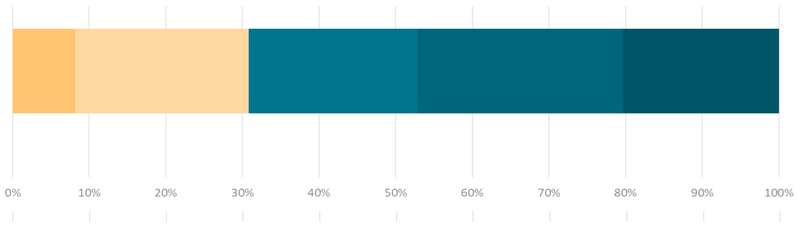
Quality related concerns



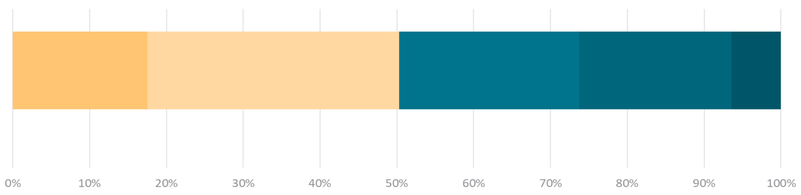
The degree of concern around **contaminated supplies was higher in the SW than the NE**. Risks were often associated with land-use change. Those with fewer than two years' experience of using PWS were most likely to be concerned about future increases in contamination

Quantity related concerns

Current concerns about having **insufficient** water for their needs



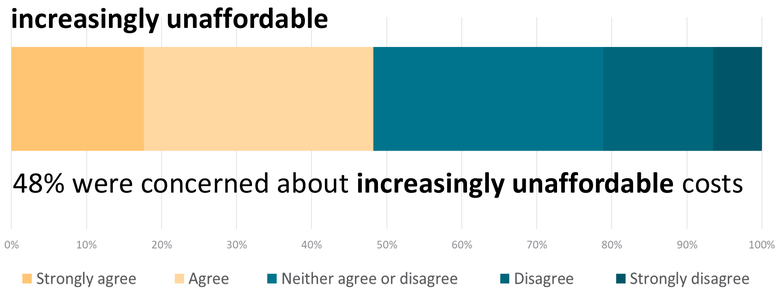
Concern the PWS will be at **increasing** risk of drought



Those in the **SW were more concerned about water scarcity than in the NE**. Concerns about reduced water supply due to increased local abstraction and changes to surrounding land use, were also more prominent in the SW.

Affordability concerns

Concern that the **cost of maintaining a supply** will become **increasingly unaffordable**



48% were concerned about **increasingly unaffordable** costs

Where **support for PWS management** is needed, it tends to be sought from contractors, neighbours, or Local Authorities, but this is not always easy to access or afford.

"Complain to landlords. Plead for support from landlords. Query about water supply deeds and rights"

"We have an extra supply from rain-water."

"Local neighbour arranged with council for drinking water"

Conclusions

- Respondents expressed concerns about both the quality and quantity of their supply. Risks to these were expected to rise alongside expectations of increasing costs for maintaining or upgrading their PWS. Regional differences were evident with those in the SW perceiving greater risks regarding scarcity and contamination than those in the NE.
- Those needing support to maintain their PWS would seek it from contractors, neighbours, or their Local Authority. There was low awareness of water quality testing requirements, or financial support that may be available to upgrade their PWS. This has implications for how PWS users perceive risks, and their ability to adapt.
- **These findings, will contribute to ongoing water policy discussion and associated guidance. We highlight the need to address the various needs of different PWS households, and their ability to adapt to, and mitigate, perceived risks.**

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Scottish Government
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