CREW CENTRE OF EXPERTISE FOR WATERS

Overcoming barriers to engaging with private sewerage users in support of sustainable rural water services

Policy Brief

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Overview

- Scotland's River Basin Management Plan (21-27) commits SEPA to supporting householders to transition to more sustainable wastewater treatment systems.
- Current forms of agency engagement with private sewerage users have been primarily limited to the provision of information about rights and responsibilities. The information that is available is often not easily accessible.
- Effective engagement is important to address some of the challenges that user-managers of private sewerage systems face in acting to improve the performance or their systems.
- But effective engagement itself encounters barriers. These barriers range from low problem-awareness to cultural norms around wastewater, to trust and relationships with public agencies.
- Innovative and evidence-based approaches to engagement can help to overcome these barriers, and create an enabling environment for private sewerage users to make sustainable decisions/take voluntary action

Contents

Background

In Scotland, privately managed, on-site sewerage systems, the majority of which are septic tanks, are something of an unknown quantity in terms of their prevalence an impacts. This uncertainty results from disaggregated data sets across SEPA, Scottish Water, and the Scottish Assessors, as well as the relatively recent requirement (2012) for licensing private septic tanks at the point of property transfer. Estimates of the number of households serviced by private sewerage range from 180,000 (SEPA) to upwards of 468,000 (CAS 2017/18). A key feature of PSS is that they are often used and managed at household scale, with a smaller proportion under shared usage.

Recent research has focused on the **impacts** of private sewerage systems (PSS) in Scotland. This work highlights a range of potential environmental and public health impacts of existing PSS, including the ecological impacts of phosphorous and other nutrient pollution (Richards et al. 2016), as well as risks associated with pathogenic contamination, particularly when in contact with shellfish waters (Hassard et al. 2017), bathing waters (Quilliam et al. 2015), or drinking water sources (Strachan et al. 2021) . The nature and scale of these impacts are linked to poor maintenance, under sizing, change of occupancy (especially in areas with seasonal or tourism-related population influxes), location or siting, and proximity to watercourses (Glendell et al. 2020; Gunady et al. 2015; Devitt et al. 2016). The issue of poor or inadequate maintenance have sparked an interest in how user-managers of these systems access information about how to sustainably manage their PSS. Research by Citizens Advice Scotland (CAS) found that there was work to be done to improve the quality, accessibility and signposting of information for PSS user-managers (CAS 2017/18). Other work points to a lack of knowledge and resources as key barriers that prevent private users from taking action (Akoumianaki & Ibiyemi, 2022).

The mounting evidence about the impacts of PSS has produced a range of recommendations about how to improve the performance of these systems. Recent CREW work has recommended upgrading to secondary and tertiary treatment systems which could reduce some soluble reactive phosphorous emissions to water by up to one half (Glendell et al. 2020). Other CREW work has highlighted the need for awareness raising among users as a means to improve maintenance and reduce pollution causing behaviours (O'Keeffe et al. 2015). CAS has recommended the creation of an Information Hub to improve the provision of information to PSS users (CAS 17/18).

These recommendations are reflected in Scotland's policy ambitions. The Water Framework Directive is underpinned by an emphasis on preventing deterioration and enhancing the status of water bodies. To reflect this emphasis, River Basin Management Plans (RBMP) for Scotland identify wastewater discharges as key form of rural diffuse pollution that puts pressure on water bodies and commits to improving the performance of wastewater systems (NatureScot). SEPA has committed to working with stakeholders to "ensure small communities, small businesses, and the environment are benefitting from well performing and reliable . . . . wastewater systems" and to develop guidance for new installations and upgrades (Scotland RBMP 2021-2027, pp 14-15; SEPA Sector Plan 2019; Escudero et al,. 2022).

What these solutions have in common is that they require the user-managers of these systems to take action. This action could take a variety of forms (e.g., improving maintenance and management practices, upgrading systems, installation of new systems, or mains connection).

The Case for Rethinking Engagement

Despite the emphasis on knowledge and awareness to support behaviour change and voluntary action on the part of PSS users, evidence suggests that **making information available alone is not enough to stimulate action**. As has been reported with Private Water Supply users, there is great variability in communities and households' capacity to utilise information, undertake assessment of current state and future options, and make improvements to existing systems, thus one-size-fits all guidance may fail to result in action (Teedon et al. 2017). This finding chimes with wider literature about knowledge transfer and behaviour change which highlights the multitude factors which shape public reception of scientific and technical information (Blackstock et al. 2010; Cooke and Zurita 2019; Levin and Cross 2004).

In the context of Scottish PSS, current levels of engagement are limited to the provision of information about rights and responsibility, and primarily in the context of ad hoc inspections or in response to concerns about nuisances caused by improperly functioning sewerage systems (Helwig et al., 2022). Arguably, this engagement is further limited by a lack of clarity about the size and scale of the PSS issue.

Fostering positive action to improve the condition and performance of PSS **will require better engagement**. The ambition to support PSS user-managers to make sustainable choices—anything from simple everyday modifications in the way they maintain their systems, to more significant decisions about adopting new systems—will require agencies to rethink their strategies for engagement. These strategies should be informed by

theory and evidence. In other words, they should emerge out of an understanding of what stands in the way of these users engaging with public agencies and other stakeholders. Having established an understanding of the barriers to effective engagement, any strategy should then consider best practices for participation as laid out in a recent report commissioned by CAS and Scottish Water (Ipsos Mori, 2019).

This brief seeks to build that understanding and put forward a multi-pronged strategy and set of tools for engagement that move us from the current approach to a mode of engagement that supports these users to make sustainable decisions. The focus here is on the barriers that may constrain user-managers of private sewerage systems, as opposed to those which may be internal to agencies wishing to initiative engagement. While we do reflect on the cost implications of different forms of engagement, we acknowledge that an in-depth account of organisational barriers to improving engagement is beyond the scope of the present brief.

Effective Engagement

From a policy intervention point of view, engaging stakeholders, including households and communities, is key to progress the adoption of more sustainable practices. Effective engagement between the sectoral agencies involved in the regulation and practicalities of PSS and the users- managers of those systems is a critical piece in the creation of enabling environments that empower people to make sustainable choices about their PSS. In the context of this policy brief, **engagement refers to getting PSS users involved in achieving more sustainable wastewater treatment systems.**

There is a wide spectrum of mechanisms to involve citizen's views in public activities, ranging from the design to the implementation of policies, strategies, services, etc. and which entails what is commonly referred to as "public participation" or "engagement". Typologies of engagement have been developed based on the idea of a continuum of participation, from non-existent to total citizen control. These typologies use the image of a ladder that was first proposed by Arnstein (1969) and which has been widely used and adapted. A particularly helpful adaptation of this progressive theory of engagement is provided by the International Association of Public Participation (IAP) (Figure 1). This engagement spectrum focuses on the objectives of engagement, making it particularly suited to contexts where engagement fulfils specific policy objectives.

Given the policy emphasis on supporting sustainable decisions, we focus on levels of engagement that are characterised as involve, collaborate, or co-lead. This focus aligns with the ambitions for community engagement in Scotland, and specifically for the water industry (Ipsos Mori 2019). This brief is based on a rapid review and analysis of literature on public participation and engagement. For the purposes of this work, we review examples of engagement in the provision of services in rural areas and the management of natural resources with a focus on evidence from water and wastewater service contexts. The full list of sources can be found below.

The insights generated from this wider body of evidence support a characterisation of the types of barriers to engagement that are **relevant in the context of private sewerage**. By reflecting on the commonality of these barriers, our analysis identified approaches and tools that can overcome these barriers and support decision making processes. The findings of this review and analysis were presented to water sectors stakeholders (SEPA, Scottish Water, Citizen's Advice Scotland), in February 2022, and the conclusions and recommendations of this brief reflect their feedback and input.

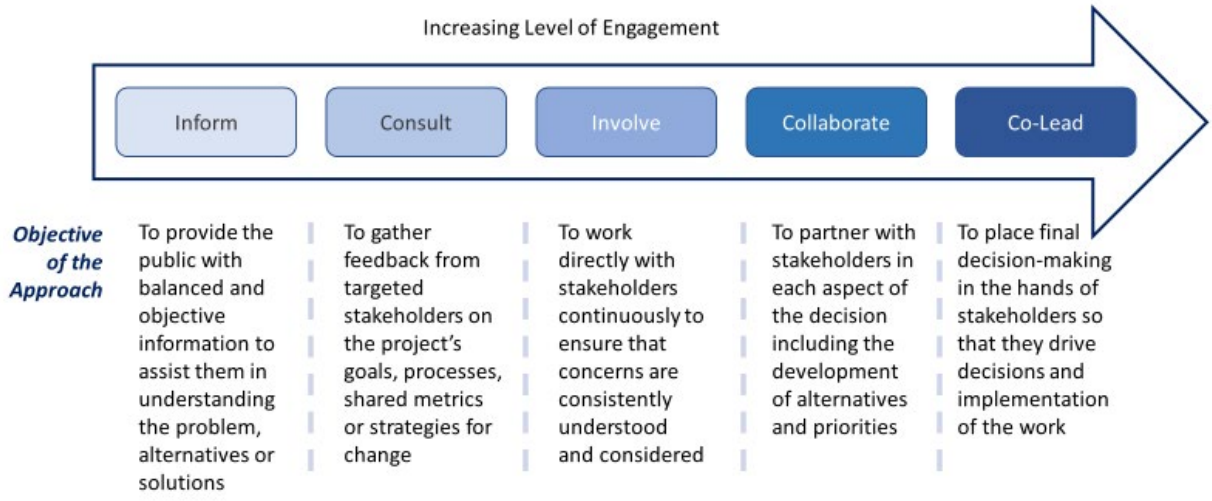

Figure 1: IAP2 Engagement Spectrum

Challenges to Engaging with Households and Communities: Wastewater

Engaging with households and communities to consider wastewater management issues is likely to be constrained by barriers that are specific to wastewater, as well as to more general barriers to engagement and participation (Figure 2).

There is a modest body of research that has considered in depth the issues of engaging households and communities around wastewater management issues. The bulk of this work has focused on engagement around the development of new decentralised wastewater systems, as an alternative to existing centralised approaches. There is also a more extensive body of work that considers the challenges of engaging with the public to generate support for wastewater management approaches which incorporate an element of water reuse. Research to date has suggested that acceptance of wastewater reuse would be improved with early and active engagement so that people are committed to the wider goals of wastewater management early on (Mankad et al. 2010).

To date, there is only a very limited focus on engagement with users of existing on-site sewerage systems, and most of this work has focused on the Republic of Ireland (see Devitt et al. 2016; Naughton and Hynds 2014). Yet there are some significant barriers that emerge form the literature on new decentralised approaches and wastewater reuse that have generalisability to the PSS context. Thus the subsequent sections focus on the barriers to engagement that have been explored in the wider context of wastewater management, and reflect on how these play out in the context of private sewerage.

Challenges to engaging people in wastewater management issues that arise from the literature include:

- ***Cultural Norms*** associated with wastewater. Much research on wastewater has focused on the role of aversion or disgust to human waste as a barrier to not only interaction with, but even talking about wastewater. This cultural aversion is described variously as the 'yuck factor' or a 'flush and forget' mentality. Although obvious public health concerns motivate our innate feelings of disgust toward human waste, research has shown that these function as

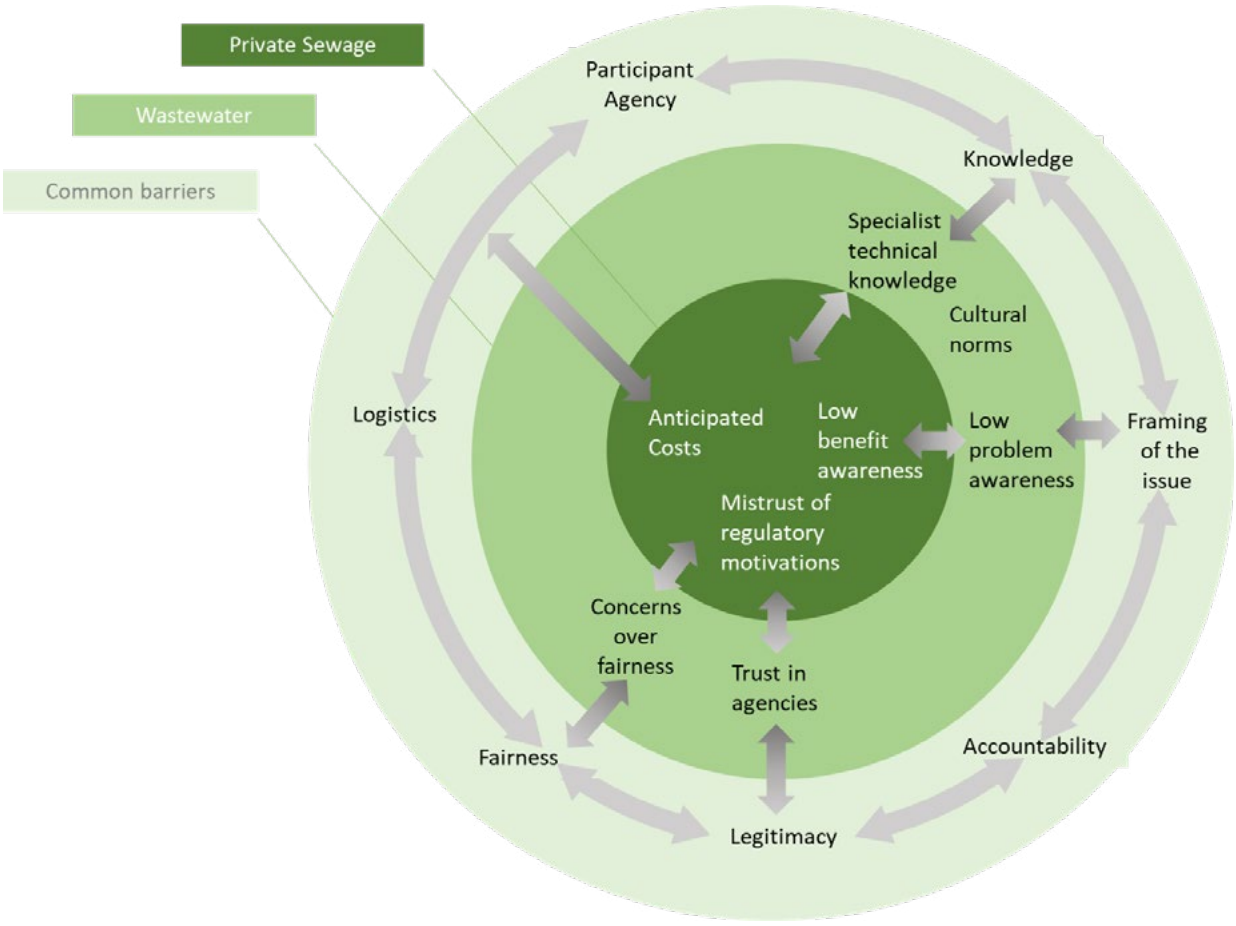

Figure 2: Barriers to Engagement

barriers to rethinking wastewater management, as well as contributing to some of the site-specific issues such as poor maintenance, misuse, and low problem awareness. These issues can be particularly salient where communal management arrangements are being considered (Friedrichsen et al. 2021; see box 1). But other research has suggested that the aversion is more complicated than some irrational or unfounded response, and that it is often entwined with wider issues of mistrust in public agencies or concerns and conflicts associated with development pressures (ibid; Ormerod 2016). As such, cultural norms are likely to intersect with other barriers.

- ***Low Problem Awareness*** is associated with low risk and vulnerability perception. Devitt et al. (2016) show how among Irish households using septic tanks, there was a belief that septic tanks were functioning properly unless visual or olfactory indicators suggested otherwise. Research has also highlighted significant disparities in how risk is understood across stakeholder groups, where for example, individuals may perceive the impacts of their single sewerage system as low impact and low risk, but a regulator may bundle those impacts across sites, and in doing so identify a higher level of risk (Black and Baldwin 2012). Other research has highlighted lower levels of awareness of wastewater management issues particularly salient in contexts where scarcity is not an issue, or where other water management issues are not high profile (Gomez-Roman et al. 2020). In the context of private sewerage, low problem awareness is linked with **low benefit awareness.** For example, if the issue of private sewerage is of low interest and any change to these systems is seen to offer no improvement in participant's circumstances, it would be more difficult to successfully engage people (Kallis et al 2021). The issue of low problem/benefit awareness chimes with wider work on engagement which suggests that this barrier can arise from the way an issue is framed. **Issue framing** 'connects the mental dots' by setting out why something may be a problem, who should be responsible for it, and what can be done about it (Nisbet 2016). This also means that if an issue is framed as a conflict (for example, between environmental regulator and households), positive engagement might be hindered (Pacione 2014).
- *Lack of* ***specialist technical knowledge*** about system types and their maintenance requirements (Naughton and Hynds, 2014; Moelants et al. 2008), about design and parameters of existing systems, or about the related costs and benefits of different types of systems (Devitt et al. 2016) can constrain engagement. It is a barrier to engagement common in other highly technical issues and can mean that engagement requires more commitment of time and resources on the part of all parties.
- ***Trust in Public Agencies*** *and clarity about accountability:* Devitt et al. 2016 highlighted the way households feared and avoided registration of septic tanks because they believed it was with the primary aim of generating revenue for the government. Elsewhere beliefs that if built in accordance to law and regulations, private users shouldn't be responsible for rectifying system failures, and that regulation unfairly targets 'ordinary householders' (as opposed to industrial polluters or centralised wastewater systems). In the Scottish case, splintered statutory responsibilities between SEPA, DWQR, and local authorities for water supply and wastewater services can create confusion and frustration for user-managers of PSS when they do seek out advice our initiate engagement. This can undermine faith in public agencies and compromise future engagement efforts. In other engagement contexts, research has highlighted the issues of low legitimacy as barriers to engagement. **Legitimacy** can be undermined if the people perceive that engagement does not provide any new information (Kallis et al 2021), the process is perceived as opaque (Green 2010), or there is lack of clarity about influence of individuals and their capacity to act on the outcomes of engagement activities, leading potentially to unmet expectations (Ipsos-Mori 2019, Page & Bakker 2005). This can be especially difficult when there is no direct accountability to participants (Page & Bakker 2005), informative materials are of poor quality or legibility (Ruiz-Villaverde & Garcia-Rubio 2017), or there is lack of feedback after meetings or any other engagement action (Rouillard et al 2014, Leitch et al 2019).
- ***Concerns over fairness*** can arise from the opacity of the process of making decisions about wastewater, that has not historically been perceived as participatory or transparent (Gomez-Roman et al. 2020) This is a concern widely recognised as an obstacle for engagement and active participation more broadly. Perceptions of lobbying or backroom chats between the agencies tend to hinder participation, as do situations where 'the usual suspects' are seen to dominate decision making processes (Ipsos-Mori 2019). It is also important to recognise the additional barriers that marginalised groups face in processes of community engagement is key to ensuring fairness of process (Markantoni, Steiner & Meador 2019; WhatWorksScotland, 2017).
- ***Anticipated costs*** *of action.* If users perceive the outcome of engagement will be the expectation to take action, concerns over costs (e.g., availability of land for installation of new systems, capital costs of remediation or upgrades) may arise at the

Box 1: Special Considerations for Engaging with user-managers of shared PSS

Engaging with people about the maintenance and/or upgrade of shared private sewage systems, apart from all the considerations detailed above, requires paying attention to additional aspects. For the engagement to be successful, it is important to build consensus around the need for engagement, which can be more difficult in communities where there are existing social conflicts or latent tensions (e.g., permanent residents – seasonal residents). Engagement in these context requires an active approach to ensure the process is inclusive by considering:

- Yuck factor can amplify community divisions and prejudices in certain contexts.
- Engagement should be as inclusive as possible, trying to represent everybody and avoiding that the process is captured by "an elite" or the usual suspects. Otherwise, participation tends to be dominated by men and those with higher levels of education. Exclusive processes may leave certain members of the community feeling marginalised or disempowered and may undermine any resultant action .
- Clarity is needed regarding representation and capacity of the participants.
- Additional consideration should be put in the timing of engagement activities, that might prevent the engagement of some people (e.g., seasonality, working patterns).

engagement phase. In this case, concerns over cost can become a barrier to engagement, particularly in contexts where there are more general concerns or lack of clarity over distribution of costs and benefits of any new approach to wastewater management (see also Helwig et al. (2022)).

- In addition to the barriers to engaging people around wastewater and specifically private sewerage, there are **logistical** barriers to engagement which are common to most forms of participation in decision making. These are: consultation fatigue (Kallis et al. 2021), particularly in communities where there might be other simultaneous participatory process ongoing (Palutikof, Steet & Gardiner 2019), intensively time-consuming activities (Jonsson et al 2011, Messner, Zwirner & Karkuschke 2006; Markantoni, Steiner & Meador 2019), tight time scales for delivering engagement and inadequate allocation of resources for preparation (Pacione 2014, Kallis et al 2021), medium and long-term stability of the participants (turnaround of staff in the agencies and seasonality of residents) particularly in long-term engagement (Nimegeer et al. 2011), and reliance on Internet-based approaches in contexts of digital divide and when information might difficult to find in the websites (Ruiz-Villaverde & Garcia-Rubio 2017; Kallis et al. 2021).

Overcoming Barriers to Engagement

Many of the barriers described above are not unique to wastewater or indeed private sewerage contexts and have been described in various forms in the wider engagement literature. Recognition of this generalisability enables the identification of innovations in engagement which address these common barriers, and which have potential utility in the context of engagement of PSS user-managers.

Around the world, a wide range of tools and methods are being successfully used for engaging communities in making decisions towards the adoption of more sustainable practices (see a non-exhaustive list see Table 1). These engagement solutions range from the enhancement of conventional communication action to the co-production of new arrangements. It is usual to combine two or more, particularly in more complex engagement designs.

The characteristics of each engagement context will make any tool more/less appropriate. When selecting an approach and tools for engagement, careful consideration must be given to the objectives for the engagement, the characteristics of the people to engage with, the presence/absence of barriers to engagement, and the resources available.

Table 1: Tools Used to Support Engagement		
Type of solutions	**Focus**	**Tools**
Communication	Raise awareness about problems associated with private sewerage and sustainable management options.	Constructive information strategies [1] Broadcast extension films [2] Improved communication approaches [3] Narrative interventions and framing [4, 5, 6]
Knowledge exchange	Awareness- raising and capacity building about sustainable management of private sewage	Consultation meetings [7] Participation days and on-site demonstrations [2, 8, 9] Training programmes and mentoring [10, 11] Peer-to peer groups (e.g. communities of practice) [12]
Mapping	Locate resources and impacts within a given territory, contribute to informing decision-making and raise awareness about environmental problems and benefits of solutions.	Participatory mapping with integrated GIS and multi-criteria approaches [13, 14] Landscape visualisation theatre [15] Online participatory planning tools [16]
Model assisted tools	Develop diagrams and/or mathematical models to represent multi-casual relationships and processes to assist decision making based on perspective of multiple users.	Model assisted participatory goal formulation [17] Participatory modelling [18] Multi-criteria decision-making techniques [2]
Experimental approaches	Pilot innovative actions at small-scale with users and undertake participatory evaluation	Living-labs and real-world laboratories [19, 20] Incubators [21] Intermediary groups supporting niches for experimentation [2]
Scenario planning and simulation practices	Agree on a shared vision for the future and inform strategic planning to make it possible.	Scenario planning and backcasting [23] Community participatory risk assessment [24] Planning simulation game [25] Role-play simulations [23]

1 Mankad & Tapsuwan 2011. Review of socio-economic drivers of community acceptance and adoption of decentralised water systems.
2 Sadeghfam & Abadi 2021. Using intentional and geographical-spatial location data in establishing and managing of rural wastewater treatment plants.
3 Moser 2016. Reflections on climate change communication research and practice in the second decade of the 21st century: what more is there to say?.
4 Ziegler 2019. Viewpoint – Water innovation for a circular economy: The contribution of grassroots actors.
5 Poortvliet et al 2018. Acceptance of new sanitation: The role of end-users' pro-environmental personal norms and risk and benefit perceptions.
6 Gómez-Román et al 2020. "Who Cares?": the acceptance of decentralized wastewater systems in regions without water problems..
7 Rouillard et al 2014. The role of public participation in encouraging changes in rural land use to reduce flood risk.
8 Jeffers 2020. Barriers to transformation towards participatory adaptation decision-making: Lessons from the Cork flood defences dispute.
9 Prouty et al 2018. Socio-technical strategies and behaviour change to increase the adoption and sustainability of wastewater resource recovery systems.
10 Moser & Pike 2015. Community engagement on adaptation: Meeting a growing capacity need..
11 Hall et al 2021. Drinking water delivery in the outer Torres Strait Islands: sustainable water issues in remote Indigenous communities.
12 Maibach 2021. Supporting communities of practice as a strategy to accelerate uptake of environmental science for climate action: TV weathercasters.
13 Brown et al 2012. Public participation GIS: a method for identifying ecosystem services..
14 Higgs et al 2008. Using IT approaches to promote public participation in renewable energy planning: Prospects and challenges..
15 Green 2010. The role of Public Participatory Geographical Information Systems (PPGIS) in coastal decision-making processes: An example from Scotland, UK.
16 Glaas et al 2020. Visualization for Citizen Participation: User Perceptions on a Mainstreamed Online Participatory Tool.
17 Jonsson et al 2011. Defining goals in participatory water management: merging local visions and expert judgements.
18 Halbe et al 2020. Participatory modeling for transition governance: Linking methods to process phases..
19 Schäfer & Scheele 2014. Bridging the transformation gap with " living labs " ?.
20 Schäpke et al 2018. Jointly experimenting for transformation?: Shaping real-world laboratories by comparing them.
21 Warbroek & Hoppe 2017. Modes of Governing and Policy of Local and Regional Governments Supporting Local Low-Carbon Energy Initiatives.
22 Watson et al 2020. Responding to the Energy Transition in Ireland: The Experience and Capacity of Communities.
23 Susskind & Kim 2021. Building local capacity to adapt to climate change.
24 van Aalst et al 2008. Community level adaptation to climate change: The potential role of participatory community risk assessment.
25 Nimegeer et al 2011. Addressing the problem of rural community engagement in healthcare service design.

The examples that come specifically from engagement in wastewater management emphasise improving knowledge. This is unsurprising given the importance of the low awareness barriers. For instance, Särkilahti et al 2017 highlights the relevance of making visible the links between actions and resulting benefits and so increasing the knowledge on the impacts of new actions in comparison to the existing system.

Solutions are sometimes combined in practice; for example, developing models as part of scenario planning exercises. Models can be used to stress test potential decisions over different scenarios (robust decision making analysis) and for considering short-term and long-term conditions (epoch-era analysis) (Moallemi et al 2020).

Generating positive feedback loops between the engagement, tools and actions is also seen as positive. For instance, engagement that supports data acquisition and modelling might help to develop a future case for the maintenance or upgrade of systems (Bichai, Kajenthira and Murthy 2018), or could even linked to the use of smart metering technology (Fornarelli et al 2021).

Box 2: Overcoming low problem/benefit awareness and building capacity

- A programme of **on-site demonstrations for wastewater recovery systems** made a significant impact on the adoption of new systems in Belize. The programme consisted of formal and informal demonstrations. Formal demonstrations, focused on the performance and cost of the systems, were held in public buildings with support and permission from community leaders and targeted towards businesses although open to the public. Informal site demonstrations took place during system installations, when neighbours gather and inquire about the benefits and differences between the new, unfamiliar wastewater-based system and the traditional septic tanks. Source: Prouty, Mohebbi, & Zhang (2018).
- A **mentoring programme** was **co-developed** in the outer Torres Strait Islands, Australia, to support local water operators after the installation of water treatment technology. The programme, which was designed in collaboration with regulators and island-based staff, consisted of in-person mentoring visits every second week and with telephone contact available in the non-contact week. It included the development of 'YouTube'-style clips that demonstrated correct procedures for using their own water treatment and monitoring equipment. Source: Hall et al. (2021).

Box 3: Overcoming low problem/benefit awareness, accountability, agency and framing barriers

- **Guiding visions for new decentralised water systems** were **co-produced** in Australia between utility businesses, regulators, land developers, and end-users. The aim was to create space for new socio-technical systems that address social equity issues and resource efficiency. It included co-design and evaluation: alternative infrastructure, business models, regulations, risk management practices and economic valuation frameworks. Particular attention was paid to utility ownership and maintenance of household level systems (typically owned and operated by householders but often poorly maintained with high risks of failure). Source: Quezada, Walton & Sharma (2016).
- The creation of a **voluntary label grouping system** was piloted in the Buiksloterham circular economy living lab (Amsterdam). Label grouping is an institutional arrangement that gave households an opportunity to choose a colour-label based on their level of contribution to water recycling. In this case, wastewater is approached in combination with the domains of energy and material waste, embedded in conversations about circular economy. The label system gives a sign of recognition to the people based on their level of contribution, creating transparency in the system by showing the level of contribution of every house. Source: Aghamiri et al. (2017).

Future Perspectives

A consultation exercise with the SEPA and Scottish Water policy officers highlighted the need to understand engagement with PSS users in a dual scenario that combines current engagement needs as well as working toward strategic objectives as outlined in the RBMP (21-27). Current needs of engagement are focused on targeted interventions aimed to achieve improvements in the maintenance, and in some cases upgrade, of existing PSS, while strategic objectives aim for the transformation of rural wastewater services. This challenge is not unique to wastewater management, but common to sustainability transitions. Experiences in other types of sustainable transitions suggest that there might be potential in combining transition strategies concerned with steering change toward long-term goals and intervention strategies concerned with implementing discrete impulses of change (Forrest & Wiek 2015). The combination of these two lines of work might mean developing two parallel agendas of engagement that reinforce each other. Targeted engagement aimed at intervention strategies might be distributed across sites with the goals of enhancing knowledge and building capacity for better management of on-site systems, as well as monitoring their performance and generating regular feedback. These targeted interventions can create the conditions for engagement, and underpin overarching, strategic engagement. This more strategic engagement would be with the goal of engaging communities in long-term participatory processes, co-constructing new approaches to wastewater management, and driving the transition of wastewater services.

Conclusion and Recommendations

Our main recommendation is for the development of a theory and evidence-informed engagement strategy which can support private sewerage user-managers to take action. This strategy focuses on innovative approaches to enhance knowledge and awareness, support the development of new relationships, and build capacity and skills.

Knowledge and Awareness

1. Pilot a refreshed communication strategy to raise problem and benefit awareness by:

- Continuing to seek to improve information provision by making any technical information accessible and clear.
- Conducting a workshop with PSS users to codevelop up-to-date guidance on roles, responsibilities, and available actions on the part of PSS users.
- Reframing the impacts of poorly managed PSS and benefits of action around locally relevant issues such as:
    - Property values and purchaser attractiveness
    - Circular economy/zero waste approaches
    - Household climate resilience

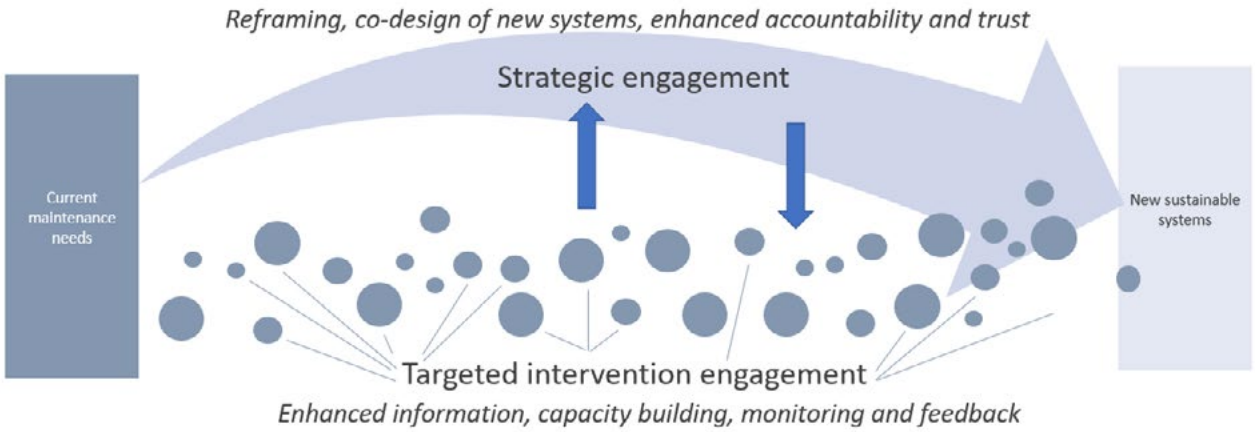

Figure 3: *Engagement for Sustainable Transitions*

New Relationships

2. Foster transparency about the aims and scope of any engagement actions regarding expectations, roles, commitment, and feedback mechanisms. Coordinate engagement with other agencies and authorities with a role in PSS.

3. Scope the feasibility of Rural Water Service Partnerships, which include stakeholders in both private water supply and private sewerage, perhaps convened within the structure of a catchment-based approach such as Catchment Partnerships.

4. Explore existing resources and mechanisms for catchment-based engagement as a potential way to reduce the costs associated with improved engagement of PSS users.

Capacity Building and Skills

5. Support innovative skills development approaches such as:

- On-site innovation demonstration days
- Peer-to-peer learning and mentoring approaches

6. Actively promote fairness of opportunity within any new skills development approaches

Creating an enabling environment which empowers and supports people to make sustainable choices about their private sewerage systems is a first step to unlocking action on the part of private sewerage user-managers. Enhancing engagement between the agencies with statutory responsibilities for private sewerage and the users and managers of these systems is a critical piece in the creation of those environments. Improved engagement can contribute to raising awareness about the problems associated with poorly maintained PSS, enhance knowledge about the possibilities for improving the functionality or upgrading PSS, and illuminate the impacts of those actions. Improved engagement can also create the potential for developing new capacities and technical skills among PSS user-managers which can reenforce the longevity or sustainability of any actions. Crucially, an enhanced engagement strategy can lay the groundwork for a relationship between the agencies and PSS users and communities, and thereby support strategic policy ambitions association with supporting sustainable transitions in rural wastewater services.

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