Circular Economy in the Community:
A Pilot Project Exploring Sustainable Models for Repair and Reuse Hubs in Wales

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Summary

The Welsh Government are planning to support 80 repair and reuse 'hubs' across Wales (Welsh Government, 2021). This pilot project aims to explore (a) different types of business models to enable repair and reuse within the community, and (b) the experiences of practitioners involved in the running of existing repair and reuse centres to identify their benefits and challenges and help inform how to establish sustainable models for repair and reuse hubs across different urban and rural locations in Wales. To achieve these aims, we reviewed the literature and conducted in-depth interviews with two policy experts and six practitioners involved in the running of existing repair and reuse centres.

Benefits of repair and reuse centres that were identified in the interviews include:
- They are an effective waste prevention service within both urban and rural communities.
- They provide significant community benefits and social functions, including fostering community spirit among service users and providers and providing opportunities to an array of support services.
- They provide opportunities for employment, training, and skill development.
- They support people in digital poverty.

Challenges faced by practitioners running existing repair and reuse centres include:
- Difficulties accessing suitable space for running pop-up or permanent hubs.
- Skills and training gaps for volunteers.
- Built-in obsolescence makes it difficult to repair products that are being brought in.
- Heavy workloads for volunteers and members of staff, in particular in urban areas
- Lack of long-term funding, with time and skill barriers to apply for funding.

Significant differences were found between the challenges that were experienced by practitioners operating in rural and urban areas. While it is more challenging in rural areas to find workable models that do not exclude remote communities, small teams working in urban hubs often experience heavy workloads due to the high demand for repair services.

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The importance of establishing behaviour change among consumers was a common theme within the interview. The interviewees considered that a change in behaviour could be achieved through repair and reuse centres by:

- Normalising repair and reuse by placing centres alongside mainstream shops.
- Using repair and reuse as an intermediary in the transition from a linear to a circular economy.
- Improving the accessibility of hubs by improving (public) transportation or by placing centres in areas with high footfall.
- Creating a welcoming environment that caters to a variety of demographics.
- Incorporating repair into the school curriculum to introduce those skills to a younger generation.

Practitioners stressed the need for government involvement in establishing sustainable repair and reuse hubs and mentioned that this should involve removing restrictions, passing enabling legislation, and assisting hubs with funding and/or accessing space needed to run them. Furthermore:

- Multifunctional hubs located in areas with significant footfall are more likely to be sustainable.
- Hubs that involve different community organisations and functions have the potential to become vibrant community centres.
- Repair and reuse hubs can be viable at different locations but face different challenges. Urban areas experience heavy workloads due to high demand, while rural areas experience challenges relating to accessibility and potential exclusion.
- Rural and urban areas therefore require different working models for repair and reuse hubs.
- All projects that were involved in this study emphasised the importance of community involvement, and many participants explained how their work had developed out of other initiatives that showed good practice.

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Recommendations

- Support is needed to identify suitable properties for repair and reuse hubs. This can be done by making existing community spaces available, help with funding to cover rent and other costs, and identifying suitable unused properties.

- Rural and urban areas require different models, and therefore support. Rural repair and reuse hubs can be made more accessible by providing better transport services, appropriate spaces for pop-up events, and mobile services.

- Support is needed for the development of skills and training of staff and volunteers involved in repair and reuse hubs. This includes (but is not limited to) customer services skills, IT skills, and driving licenses for mobile services.

- Long-term funding is needed to enable repair and reuse hubs become self-sustaining. Interviewees suggested that three years of funding would be a good period for this purpose.

- More research is needed to understand attitudinal and structural barriers to upscaling repair and reuse projects.

- Long-term policy changes are needed to regulate production, to challenge the persistence of built-in obsolescence.

Introduction

The circular economy (CE) is a model of production and consumption that aims to reduce resource usage by diverting waste and re-circulating materials within the economy (Knäble et al., 2022; Ellen MacArthur Foundation, 2013). One way of doing this is by promoting the repair and reuse of existing products within communities, which extends product life and reduces resource extraction (Knäble et al 2022). Community-based repair and reuse initiatives have multiple benefits in addition to reducing material consumption and greenhouse gas emissions. They can provide job and training opportunities and decrease financial pressure on consumers (Knäble et al 2022). The Welsh Government are currently aiming to support 80 repair and reuse hub across the nation (Welsh Government, 2021).

The aims of the project are to explore (a) different types of business models to enable repair and reuse, and (b) the experiences of practitioners involved in the running of existing repair and reuse centres to identify challenges and opportunities across different locations. To achieve these aims, we conducted a literature review and in-depth interviews with two policy experts and six practitioners involved in the running of existing repair and reuse centres. The interviews and literature review were used to outline four case studies with different organisational structures across a number of rural and urban locations, to help inform how to establish a sustainable model for repair and reuse hubs in Wales.

The rest of the report is structured as follows. *First*, it presents the results of the literature review, covering the areas of (1) the Circular Economy (CE), (2) the benefits of CE, (3) barriers to the implementation of CE, (4) the role of repairing and sharing in CE, (5) CE in Wales, and (6) CE in rural and urban areas. *Second*, it briefly discusses the methodology of the interviews and the case studies that will form part of the results section. *Third*, the report presents the results of the interviews.

This section provides a summary of the government's aim to support repair and reuse hubs, followed by an overview of four case studies. The section then continues with the key themes of the interviews with the two policy experts and six practitioners, covering the topics of benefits and challenges to supporting repair and reuse hubs in Wales, behaviour change as an integral part of repairing and sharing, and place-specific challenges faced when developing and running repair and reuse hubs in rural and urban areas.

Literature Review

This literature review briefly discusses the definition of the Circular Economy (CE) before discussing its benefits, as well as reported barriers to the implementation of CE. It then more specifically moves to the topic of repairing and sharing; the existing literature on CE in Wales; and the current literature on establishing CE in rural versus urban areas.

Definition of the circular economy

The purpose of CE is to create closed-loop systems of materials to make more efficient use of resources, by 'designing out' waste (Ellen MacArthur Foundation, 2013). The term has developed into a concept with different definitions and approaches. Kirchherr et al. (2017) identified 114 different definitions and attempted to consolidate the different understandings into a single comprehensive one. Kirchherr et al. (2017) defined CE as:

> "...an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity, and social equity, to the benefit of current and future generations".

This definition includes the method, scale, and goals of CE, all of which will be covered later in this section. Importantly, the definition shows that CE is more than just a change in behaviour by consumers. Instead, it should be considered a systemic shift that incorporates multiple actors, including governments, producers, and consumers, as well as assorted designs and infrastructure.

The three main principles of CE are keeping resources and inputs minimised, circulating materials in loops of varying lengths, and reducing the harmful outputs of current supply and consumption systems (Fogarassy and Finger, 2020). CE is divided into two distinct loops for biological and non-biological materials respectively (see Figure 1). Breaking down CE's loops into actions for users is best done with the '9R' framework, which includes *reducing, refusing, redesigning, reusing, repairing, refurbishing, remanufacturing, repurposing*, and *recycling* (Schröder and Raes, 2021). This project focuses on non-biological materials, and then in particular on the loops that are close to the user of those materials.
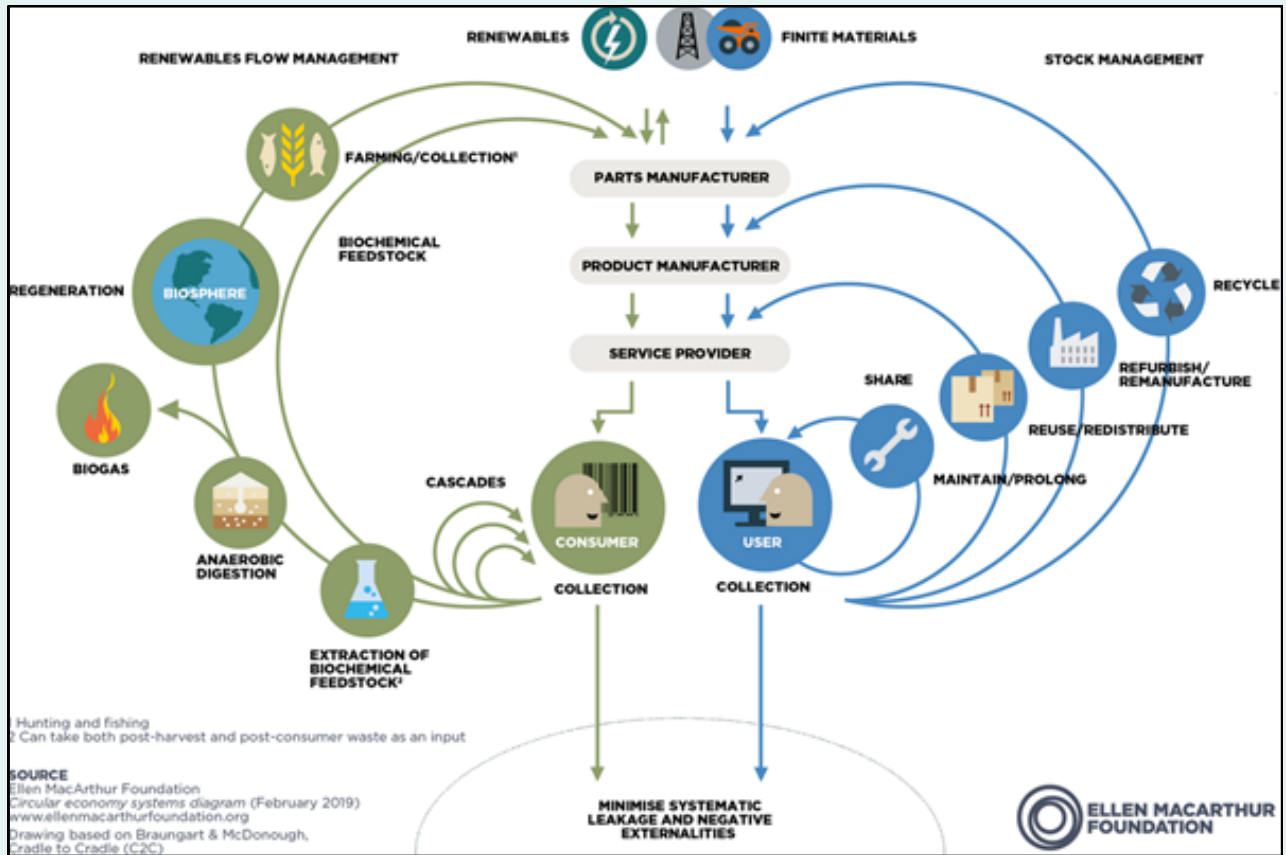
Figure 1: The Circular economy (source: Ellen MacArthur Foundation, 2019)

Benefits of the Circular Economy

CE is described as a win-win-win economy that supports economic, environmental, and social aspects of sustainable development. The Ellen MacArthur Foundation (2013) highlights the economic benefits of CE, saying that businesses can save on material and energy costs, reduce externalities, broach new profit pools, and lower supply chain risk. Other scholars (Knäble et al., 2022) note the importance of reduced greenhouse gas emissions (GHG) and reduced environmental damage from resource extraction and waste disposal.

Although less attention has been paid to the social benefits of CE, it provides employment opportunities because it relies heavily on service-based labour and reallocation of resources (Fogarassy and Finger, 2020). Additionally, some authors argue it can support regional development through localised supply chains (D'Amato and Korhonen, 2021). It may also allow consumers more options for products and improved customer service (Ellen MacArthur Foundation, 2013).

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The benefits do however vary according to the different material loops that are being established. For example, recycling, as the most cited material loop (Kirchherr et al., 2017), only has a small impact on GDP or GHG emissions but can create jobs (Moss et al., 2022; Barreiro-Gen and Lozano, 2020; Knäble et al., 2022). Repairing on the other hand is one of the most impactful practices in terms of jobs, GDP and GHG emissions, and is therefore essential for the transition to CE (Knäble et al., 2022).

Aside from Knäble et al. (2022), there is limited research on the long-term, environmental impacts of CE (Corvellec et al., 2022; Korhonen et al., 2017). It is important to note that existing CE approaches may still produce waste (e.g., compostable packaging) and emissions (Corvellec et al., 2022; Korhonen et al., 2017; Moss et al., 2022). Companies that rely on waste may still have to revert to virgin materials when there is a lack of supply (Kirchherr et al., 2017).

Businesses and organisations may also not be fully committed to system change, resulting in the commodification of CE, or the diversion of resources – especially financial – away from sustainable consumption (Corvellec et al., 2022; Kirchherr et al., 2017; Korhonen et al., 2017). In the literature, it was noted that the economic, environmental and social benefits of CE are not receiving equal attention, with the ideological agenda of CE being dominated by technical and economic considerations (Kirchherr et al., 2017; Corvellec et al., 2022).
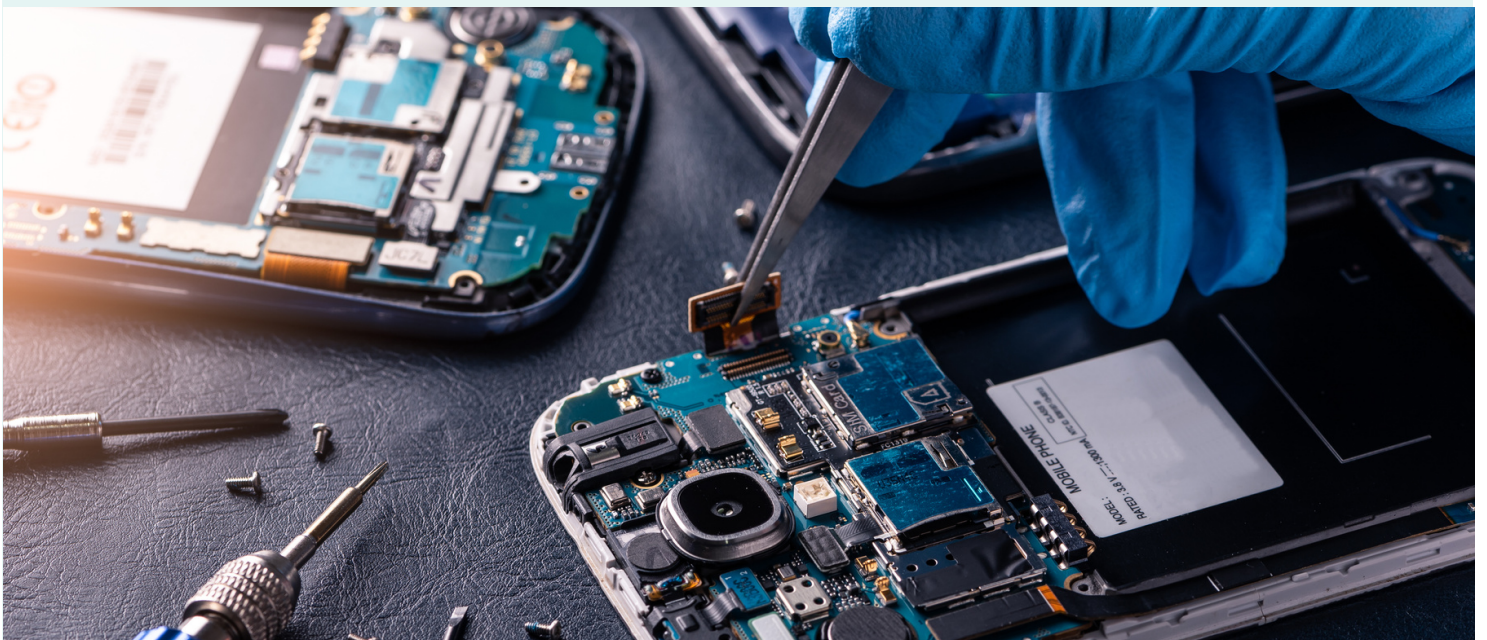
Barriers to the Circular Economy

Several barriers are reported to the implementation of CE that apply to different actors and aspects of CE in general and repair and reuse in particular. These include, but are not limited to, the following:

- **Consumers:** CE requires consumers to adapt to new practices (Corvellec et al., 2022; Korhonen et al., 2017; Moss et al., 2022). Currently, many consumers prefer to replace items, rather than repair them, because it is more economical and less time-consuming (Van der Velden, 2021). Given the competitive pricing of new products, they may not see the value in repairing the item (Van der Velden, 2021).

- **Product repairability:** Products often require specialised tools or parts to repair, or are difficult to repair (Van der Velden, 2021). Sometimes the information on how to repair an item is difficult to access. Additionally, there is a lack of warranties on products, exacerbating consumer reluctance to pay for repairs. Collection, assortment, and redistribution of material may also not be compatible with current infrastructure (Moss et al., 2022).

- **Economics and profitability:** A tension exists between seeking profit and slowing and narrowing material flows – or reducing consumption – which prevents some businesses from participating (Moss et al., 2022; Schröder and Raes, 2021). Initial investment may be expensive and there is insufficient funding for CE projects (Moss et al., 2022; Schröder and Raes, 2021).

- **Logistics:** CE is dynamic and there is not one definition, inhibiting a consensual plan across scales (Kircher et al., 2017; Korhonen et al., 2017). Given that it aims for systemic change, it requires significant collaboration between supply chain actors, policy, and individual consumers, which may be difficult to achieve (Korhonen et al., 2017; Fogarassy and Finger, 2020; Barreiro-Gen and Lozano, 2020; Corvellec et al., 2022). This is compounded by the lack of data on implementation and practical application from theory (Fogarassy and Finger, 2020; Barreiro-Gen and Lozano, 2020; Schröder and Raes, 2021).

- **Government policy**: There is no coherent policy to encourage CE. In some cases, there may even be restrictive policies prohibiting CE actions (Moalem and Mosgaard, 2021; Moss et al., 2022; Schröder and Raes, 2021; Shevchenko et al., 2023; Van der Velden, 2021).

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Proposed solutions to the identified barriers include:

- **Consumers:** The temporal, spatial, and cultural context must be considered when electing a CE model (Korhonen et al., 2017). Cultural meanings and behaviours need to be changed to make CE part of people's day-to-day lives (Shevchenko et al., 2023). Marketing and pop culture icons can normalise CE models and behaviours (Moss et al., 2022) and emphasising the social benefits can encourage CE (Van der Velden, 2021).

- **Product repairability:** Urban planners can partner with service providers to integrate repair infrastructure into communities (Moss et al., 2022). CE infrastructure can be integrated with current sustainable development models or ecosystem services (D'Amato and Korhonen, 2021). Products must be accessible and competitive in price function and quality (Shevchenko et al., 2023).

- **Economics and profitability:** Investors and philanthropic funders can support businesses (Moss et al., 2022). The economic benefits of CE must be prioritised when making policy changes and working with businesses, or rather, reward positive impact and highlight the downfalls of the linear model (Schröder and Raes, 2021; Fogarassy and Finger, 2020; Shevchenko et al., 2023). There should be incentives for both businesses and consumers (Schröder and Raes, 2021).

- **Logistics:** CE needs more investment in research and development for a successful implementation of CE (Schröder and Raes, 2021; Fogarassy and Finger, 2020; Barreiro-Gen and Lozano, 2020).

- **Government policy:** Governments can remove restrictions and pass enabling legislation (Moss et al., 2022). Policy is key for investment guarantees, collaboration, roadmaps, and goals of CE (Schröder and Raes, 2021).

It is important to note that there is currently more literature on the barriers to the implementation of CE than on potential solutions to those barriers.

Repairing and Sharing in the Circular Economy

Repairing is essential for the transition to CE (Knäble et al 2022), and has the potential to create jobs, reduce GHG emissions, and increase GDP (Knäble et al., 2022). Repair is a way to extend the life of a product (Llorente-González, 2020; McLaren et al., 2020; Ruiz-Pastor and Mesa, 2023; Tellier, 2020; Terzioğlu, 2021), but could mean different things. According to McLaren et al. (2020), there are four types of repairing: (1) reconstruction restores an item to its original form and function, (2) remediation repairs an item but allows for transformation, (3) reconciliation uses original materials for a new purpose, and (4) reconfiguration involves new materials and new purposes.

The barriers to repairing and reusing are similar to those of CE in general: Consumers often find it easier and cheaper to purchase a new item than to repair an existing one (Tellier 2020).; manufacturers make it difficult to repair items (Tellier, 2020; Terzioğlu, 2021); consumers may lack technical skills, time, or financial resources to repair them (D'Urzo and Campagnaro, 2023; Terzioğlu, 2021); and there is often a stigma associated with repairing (Terzioğlu, 2021).

Repairs are usually done at home or through professional services. Professional services can be helpful and efficient, especially when the product has a warranty, but they can also be inconvenient, expensive, and impersonal (Tellier, 2020). Home repairs are convenient but may be challenging when lacking knowledge, time and skills (McQueen et al., 2022). Community repair and reuse hubs can provide an alternative to home and professional repair services.

Community repair and reuse hubs should be geographically convenient and well-timed; communicated through posters and media; and there should be clear instructions and reminders of how to access the hub (Ruiz-Pastor and Mesa, 2023; Tellier, 2020). According to the literature, the government's role in the success of hubs includes subsidizing and controlling the costs associated with repairing and sharing and creating legislation around the 'repairability scores' of items sold to consumers (Llorente-González, 2020; Ruiz-Pastor and Mesa, 2023; Tellier, 2020; Vanegas et al., 2018). To change consumer perspectives around repair and reuse, it needs to be made valuable through language, information, and systemic changes in market processes (D'Urzo and Campagnaro, 2023; Ruiz-Pastor and Mesa, 2023).

Repair and reuse hubs have the potential to be a valuable resource for the future of Wales and Welsh communities. They can transform communities and "co-create cultural values, social and economic relations and material outcomes" (McLaren et al., 2020) to demystify technology, critique consumerism, and learn about environmental concerns (McLaren et al., 2020; Van der Velden, 2021).

Some have expressed concerns about the potential for repairing and sharing to become commodified (Frenkin, 2017; McLaren et al., 2020), spark gentrification and reinforce gender roles (McLaren et al., 2020; McQueen et al., 2022; Rosner, 2014). McLaren et al. (2020) suggest that questioning the objective of repair and reuse, and paying attention to who will benefit and what is being repaired (e.g., the economy, items, community) can help to ensure that repair and reuse hubs are inclusive spaces.

The Circular Economy in Wales

The Welsh Government (2021) have taken positive steps towards CE by recognising its role in tackling environmental and biodiversity crises. This strive towards a circular economy is also tied up with a political commitment to future generations – via the Future Generations Act (Wales) 2015. The CE debate in the UK finds its origins in EU policy development (Hill, 2016). Wales already boasts an impressive recycling rate of almost two-thirds of all household waste, up from less than 5% before devolution (Hill, 2016). Data trends between 2006 and 2020 show that annual individual household waste was reduced significantly from about 410kg to less than 50kg (Williams and Phillips, 2022).

Additionally, Wales harbours an impressive range of green private sector initiatives: from projects producing bioenergy from waste food projects (Jagger, 2017) to the manufacturing of hydrogen-powered cars by private companies in Wales, such as Riversimple. While Wales already being one of the leaders in recycling, the Welsh Government (2021) aims to take this further by trying to extend the lifecycle of resources. This is expected to lead to a significant reduction of materials ending up in landfill, as well as energy recovery which is currently being used as an alternative to the extended lifecycles of materials.

As part of this approach, the Welsh Government are committed to supporting 80 repair and reuse projects across Wales. As it currently stands, there are over 30 repair and reuse projects being supported financially via the Landfill Disposals Tax Communities Scheme in Wales, which has already made £13 million available to these projects (Welsh Government, 2021).

The Circular Economy in Rural and Urban Areas

Rural and urban areas face different challenges when it comes to implementing circular economy models for repair and reuse. However, the repair and reuse literature predominantly focuses on urban areas, either explicitly or implicitly (Cohen and Munoz, 2016; Prendeville et al., 2016; Tellier, 2022), with proposed solutions often being only appropriate for urban contexts (Moss et al., 2022; Ruiz-Pastor and Mesa, 2023; Tellier, 2020).

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It can be particularly challenging for rural areas to establish repair and reuse hubs due to low population density and broader problems with (public) transportation (Goodwin-Hawkins, 2020; Woods and Utz, 2021). Only 39% of rural Wales has access to a daily bus service as of 2013, with 17% having no access to public transport at all (Woods and Utz, 2021). Additionally, the importance of digital connectivity for CE has been noted elsewhere (D'Amato et al., 2022; Lekan and Rogers, 2020), with rural Wales still facing poor digital connections (Woods and Utz, 2021).

Despite these challenges, rural areas could benefit substantially from CE initiatives. First, peri-urban and rural areas are more likely to experience the negative health impacts of waste management (Amenta et al., 2019; Arista et al., 2023). Second, repair and reuse hubs offer employment opportunities, community building, and skill development. A survey of 1,056 respondents showed that many young people enjoy living in Wales, but plan to move because of poor job opportunities, lack of ability to purchase a house, and limited social and cultural opportunities (Woods and Utz, 2022). Finally, CE builds upon activities that people are already participating in, especially in the information economy - 60% of the world is employed in an informal sector already practising CE through repair, reuse, and recovery based on economic necessity (Becerra et al., 2020; Korsunova et al., 2022).

Implementing CE in rural areas is possible where multiple actors are involved in its development, external support is offered, communities have sufficient people to volunteer, and initiatives are community-led (Goodwin-Hawkins, 2020). Government support (and funding) is crucial, as this can be used to "strategically stimulate hub development, without the government itself needing to become the hub operator or service provider" (Goodwin-Hawkins 2020).

Living labs have been a successful model in peri-urban areas of Italy and the Netherlands (Amenta et al., 2019). Living labs are physical and virtual spaces based on innovation, co-creation, and collaboration between citizens, organizations, and government agencies. They focus on co-creation, rapid prototyping and testing, and the scaling-up of possible solutions (Amenta et al., 2019). Becerra et al. (2020) contend that co-designing is essential to the implementation of CE principles, as there is no 'one problem with one solution'.

While it is often assumed that there is an urban-rural divide, it needs to be remembered that rural and urban communities are deeply interconnected, which may be exploited for specific CE models (Thapa et al., 2020). Repair and reuse hubs could be located in 'intermediate' towns within rural areas to reduce travel times from more remote areas (Thapa et al., 2020); services may be provided by bringing multiple services together into a single location; or services could be provided on a mobile basis. Repairable or reusable waste, such as electronic waste, could be

collected on waste removal days so that people do not have to drive to drop off their waste, which might create more emissions (Nowakowski and Mrowczynaska, 2018). Life cycle assessments are needed to determine the most sustainable way to approach CE in rural areas (Nowakowski and Mrowczynaska, 2018).

Semi-structured interviews

This pilot project included eight semi-structured interviews, two with policy experts and six with practitioners involved in the running of existing repair and reuse centres (see Table 1). The interviews were analysed through a pragmatic (rapid) thematic analysis (Burnard, 2011) to identify the main topics of the interviews.

First, we interviewed two policy experts with experience in CE in general and repair and reuse in particular. These participants gave their account of the Welsh Government's aim to support repair and reuse hubs in relation to their wider ambitions and policy strategies related to waste reduction.

All interviews were tailored to suit the needs of different participants. Overall, three interviews were carried out on zoom, one was carried out by telephone, and four took place in person. Recordings were either done via zoom, external recording devices, or through written notes. All recordings were kept secure on the university network. Participants will be referred to as "practitioner", "policy expert", "interviewee" or "participant" to maintain their anonymity. The research received ethical approval from the Welsh School of Architecture Research Ethics Committee.

Methods

Label	Position	Interview format
Policy Expert 1	Anonymous	Zoom
Policy Expert 2	Anonymous	In Person
Practitioner 1	Repair Café Coordinator	In Person
Practitioner 2	Repair Café Coordinator	In Person
Practitioner 3	Repair Café Coordinator	Telephone
Practitioner 4	Mobile Repair and Reuse Service Representative	Zoom
Practitioner 5	Social Enterprise Representative	In Person
Practitioner 6	Umbrella Organisation Representative	Zoom

Table 1: Participants in the interviews

In this section, we first provide a summary of the Welsh Government's aim to support repair and reuse hubs across Wales, through sharing interpretations from the policy experts that we interviewed. We then provide an overview of four case studies of repair and reuse initiatives with different organisational structures across a number of rural and urban locations. This is followed by the main themes emerging from the interviews, namely: the benefits and challenges of supporting repair and reuse hubs in Wales, behaviour change as an integral part of repairing and sharing, and place-specific challenges faced when developing and running repair and reuse hubs in rural and urban areas.

Repair and Reuse Hubs in Wales

The two policy experts gave their account of the Welsh Government's initiative to support the development of repair and reuse hubs across Wales. It was explained that the development of 80 repair and reuse 'hubs' across Wales is still "very much in motion". As one participant mentioned: "nothing is set in stone" (Policy Expert 2). Income generation and self-sufficiency were considered crucial factors in determining the success of the hubs. One policy expert explained that it might be useful to find out more about: "what does a sustainable model look like?" (Policy Expert 1). This includes projects operating at different levels: micro and macro. One of the policy experts explained that there were already different approaches and funding streams operating in different areas, with a distinction between rural and urban initiatives.

It was emphasised that a network of hubs is intended to strengthen existing infrastructure, choosing to "layer on top of what's already existing" (Policy Expert 2), rather than to instigate a top-down approach. This approach was supported by a representative from an umbrella organisation, who contends that supporting grassroots initiatives is an effective way of developing a repair and reuse infrastructure. To achieve this, the policy experts explained that the Welsh Government were looking at ways in which they could offer practical support to the wide variety of organisations operating successfully in this area. This includes practical support for projects, allocating funding, helping projects access spaces, and identifying skills and training gaps.

The interviewees recognised the need for 'cultural change' to normalise repair and reuse. Positive public attitudes towards repair and reuse are essential to establishing a sustainable supporting infrastructure. Indeed, as one participant puts it, one cannot implement activities "unless people want to do it." As it currently stands, the Welsh Government are utilising research to scope out attitudes and motivators towards repair and reuse. There is a broad aim to change popular discourse by putting repair above recycling. One participant explained that, as it currently stands, "reuse is more prolific in Wales than repair" (Policy Expert 1).

The policy experts placed particular emphasis on the development of 'hubs', which by definition are multifunctional. A mixture of services that facilitate repair and reuse can be combined and serve other important social and economic needs simultaneously. Indeed, both policy experts expressed the importance of "multifunctional spaces" and the "joining up" of good practice to allow existing projects to grow and become more mutually beneficial. One policy expert described a "sustainable ecology" (Policy Expert 1), which serves as a useful concept here to capture the holistic and complex nature of this initiative ("it's not just about one thing, it's about healthy systems.") In this respect, it already is recognised that repair and reuse hubs should be multifunctional and can meet an array of financial, social, and environmental objectives. That is, in the words of (Bradley and Persson, 2022), the projects are intended to "fix more than stuff."

Four Case Studies

Here we present case studies of four repair and reuse initiatives to illustrate what a sustainable model may look like at different scales and locations. The first case study is a mobile borrowing service in a rural part of Wales, called the "Borrow Bus". The Borrow Bus services some more remote areas and is part of a repair and reuse NGO called Resource Wales. The second case study is the pop-up repair café that has been running in various locations across Wales.

The development of the pop-up repair cafe was guided by interviews conducted with a representative of Repair Café Wales, as well as three practitioners who have experience coordinating repair cafés at different locations (one based in a city centre, one in a suburban area, and the other in a town in a more rural setting). The third case study is an award-winning, profitable social enterprise based in Scotland, the "Edinburgh Remakery". This organisation hosts a variety of activities, from repair services to workshops, to the redistribution of second-hand items donated to them.

The fourth case study is a Swedish community repair organisation called "Fixotek" and "Fix the Stuff". This case study was based on secondary data reported by Bradley and Persson (2022), who conducted seven interviews with organisers, two focus groups and observations at several workshops and repair events. Further information was gathered from Ordonez and Hagy (2019), who outline the practical process of setting up Fixoteks and its organisational structure. Fixotek and "Fix the Stuff" were selected as one of the case studies, as Sweden is often considered to be a leading country in waste management. When interviewing one of our participants indeed referred to "good examples in Scandinavia" as a source of inspiration.

Case Study 1: The Borrow Bus in Rural North Wales

The Borrow Bus emerged as an approach that builds on existing local repair cafés. The Community Interest Company (CIC) operates across two counties, using a bus to transport items available for borrowing in different areas throughout the week, as part of a national borrowing 'library of things' project. The mobile library of things visits places with good existing footfall, such as marketplaces and supermarkets. This includes some rural areas with less footfall. Concern was expressed that often remote areas are often excluded from such services.

> "Resource's motto is 'Where no-one and no-thing belongs on the scrap heap'" (Practitioner 4).

The Borrow Bus was started by a community steering group, representative of the towns and villages that the mobile library of things is visiting. The organisation is currently run by a small team of paid employees in addition to volunteers. As the project is expanding rapidly, there is a need for more workers. To remain sustainable, the CIC secured a grant from the National Lottery Climate Action Fund, with the help of another umbrella organisation called Resource Denbighshire. This organisation brings together various projects in the region that aim to repair, reuse and share items. They also provide a variety of social services: from offering volunteering and apprenticeship opportunities to working with social care organisations to provide valuable services for people with disabilities and mental health problems.

In addition to securing funding bids, the Borrow Bus sells merchandise and products that they accumulate via donations, as well as operates a membership system with different payment grades to suit different people (from £5 a year to £30 a year). They have worked successfully with a local business to advertise their services. The Borrow Bus has further collaborated with a local housing association, which agreed to offer funding for ten tenants to become members. These collaborations reveal an interesting way that organisations can team up with multiple umbrella organisations as well as other local businesses and projects to make their business model more sustainable.

Case Study 2: Repair Café Wales

We spoke with a representative of Repair Café Wales, a Community Interest Company that supports pop-up repair cafés across Wales. The company was founded in 2017, with the goal of diverting waste from landfills. The idea came from the Repair Café Foundation in Amsterdam, although much of the organizational structure was developed through trial and error. The organisation receives funding from the Welsh Government's Landfill Disposals Tax Communities Grant Scheme via the Wales Council for Voluntary Action. They currently have a network of 103 popup repair cafés to which they offer support with funding, equipment, and logistics such as risk assessments. The company offers practical and universal advice to communities to set up and maintain cafés, as well as public outreach to increase awareness. While they were historically focused on popups, they are now exploring permanent hubs, with the first hub being launched in Newport.

Generally, repair cafés are supported when a community approaches the organisation with the desire to establish one or to improve an existing event. According to one staff member in our interview, their "main ethos is that these cafés are grassroots and community-led". In addition to a representative of the umbrella organisation, we spoke with three Repair Café coordinators (one based in a city centre, one in a suburban area, and one in a town in a more rural area). All three locations followed the umbrella organisation's model and the practitioners reported that the events ran smoothly and were easy to set up with the support of the company. In return, the cafés track repairs and report back to the umbrella organisation to aid data collection about products with built-in obsolescence. However, several participants noted that they often experience difficulties keeping on top of paperwork due to the popularity of their services.

It is common that the repair cafés are held monthly in a local facility. One urban café operates in a community hub where it has free access to a room. The rural café runs in a council hall for a small fee. All the repair cafés are volunteer-led, and the donations made by attendees are sufficient to support the costs of refreshments, the space, and the supplies to function. The repair cafés would not be able to function without the support of the community, who step in where needed even if they are unable to perform repairs. All practitioners reported a supportive atmosphere with positive social dynamics.

All three repair cafés focus on breadth rather than depth when it comes to repairing items, but depend on the skills of the volunteers for that day. The two urban cafés are well-attended, sometimes with long queues and not enough volunteers. A variety of people with different demographics attend the cafés, including regular and new attendees. The rural café has a good

ratio of volunteers to attendees. They have a spreadsheet to document volunteers and their skills and hold a coordinating Zoom meeting prior. Before the monthly café, they use social media to advertise which repairers will be attending and may target specific groups (for example, if a bicycle repairer is available, they will contact local cycle groups).

Case Study 3: The Edinburgh Remakery in Scotland

We spoke with a representative from a social enterprise in Scotland – the Edinburgh Remakery, which began in 2012. They have a permanent location in Edinburgh with donation boxes throughout the UK. As a social enterprise, they work for profit and the community. Edinburgh Remakery specialises in technology and textiles, rather than focusing on a breadth of products. This is to ensure they have the appropriate expertise and, consequently, customer trust in their organisation. The Edinburgh Remakery has received significant recognition, including the Queen's Award for Best Social Enterprise.

The organisation boasts multiple income generators to stay economically sustainable. They (1) facilitate workshops and rent space in their permanent location; (2) refurbish donations and then sell them at reasonable prices both in-store and online; (3) rent out equipment, such as sewing machines; and (4) charge for their educational services. They also receive funding from corporate sponsorship, but not from the government.

As a social enterprise, Edinburgh Remakery donates some of its refurbished devices to people living in digital poverty or isolation, provides free repair cafés once a week, and provides a safe place to socialise and learn new skills. The organisation representative emphasised that repair cafés are not income generating and that donations are not sufficient to cover the costs of labour (all employees are paid a living wage). Overall, the organisation has collected 39 tonnes of electronics, repaired 73% of them, provided over 60 workshops, taught skills to over 350 people, donated over 400 devices, and created six jobs.

The Edinburgh Remakery has set up its location to look like any other electronic shop. According to the interviewee, the atmosphere of the shop is important for its success. They have created a warm and welcoming space where people feel encouraged to care for future generations and the well-being of the planet. The walls are adorned with information about waste and the circular economy, as well as art made from reused items. In the back of the store is a 'retro-tech' wall to show the rapid change in technology that leads to obsolescence. By location of the Edinburgh Remakery among other shops, they aim to normalise repair and reuse. People will often walk by and be curious, especially when a repair café is running.

Case Study 4: Fixotek and Fix the Stuff in Sweden

Fixotek (meaning 'the fixing library') was developed in 2017, following a general increase in interest in how citizens could be assisted in reusing and repairing material (Ordonez & Hagy, 2019). Fixotek aims to provide community spaces to facilitate lending, swapping, reuse and repair in the community, to allow them to manage waste closer to home. This initiative was initially led by the local government, in collaboration with NGOs, with only two location managers being paid for their work. Fixotek works with two public housing companies and a local tenant association that provides suitable spaces (Ordonez & Hagy, 2019).

Fix the Stuff was a 3-year national campaign led by an NGO. The NGO was set up and centrally coordinated by employed staff, while campaign activities and workshops were organised by members and volunteers. This included the provision of online DIY repair tutorials, temporary collective repair workshops, and places where people could access tools and learn to repair things. Therefore, this was an integrated approach to raising awareness, educating people, as well as providing infrastructure (Bradley & Persson, 2022).

> *"Community repair is not only about fixing broken stuff and reducing waste, but about building social relations, empowering people and creating space for non-consumerist forms of citizenship to develop." (Bradley and Persson, 2022: 1334)*

Fixotek and Fix the Stuff are examples of initiatives with different levels of involvement from the state. Bradley and Persson (2022) note how the two initiatives share a vision to reduce consumption (and minimised waste as a result) but differ in their approach to achieving this. The NGO-led Fix the Stuff campaign was critical of mainstream 'Circular Economy' discourse, claiming that much of this discourse still relies on economic growth and the commodification of natural resources. The campaign also involved reconceptualising ideas about work and labour, representing a more radical approach. In contrast, Fixotek sees their work as a practical way of helping individuals to reduce their material consumption. Despite having different underlying philosophies, both initiatives are aimed at bringing about a sense of empowerment, well-being, and community spirit. The spaces provided by the two projects were particularly useful for young and marginalised groups. The spaces were open to the public free of charge to keep them socially inclusive.

Fixotek reported some difficulty in upscaling and institutionalising initiatives that are informal and grassroots (Ordonez & Hagy, 2019). While it was recognised that it is essential for the government and the private sector to be involved, large-scale top-down control was advised against. It was recognised that policy needs to require producers to provide information on the lifespan of products, end built-in obsolescence, and simplify repair. It was further noted that grassroots projects are not always equipped to record information about items being processed (Ordonez & Hagy, 2019), which is arguably essential information to achieve this

Benefits of Repair and Reuse Hubs

The interviews show that the different repair and reuse initiatives have a substantial number of benefits. First, and perhaps most obviously, these services are seen as an effective waste management (and prevention) service. Repair and reuse initiatives can extend the life cycle of materials and reduce consumption, representing key steps towards a more circular economy. They appear to satisfy existing public demand. Coordinators of the repair cafés reported long queues and an impressive (albeit sometimes overwhelming) number of items being processed. It was also explained how it was this interest that facilitated the development and maintenance of these projects.

> *"It's just really nice bringing the communities together and introducing people, it makes you feel like you are part of something"* *(Practitioner 3)*

It was also explained by several participants how these projects meet other important government goals, from providing new ways of managing the cost-of-living crisis, providing warm spaces, new opportunities for education, training, and skills development, supporting people in digital poverty, and bringing together different generations.

> *"Repair cafés feed into lots of areas of Welsh policy" (Practitioner 6)*

Challenges of Running Repair and Reuse Hubs

There was consistency in the challenges reported by the interviewees. First, access to space was a recurring theme for all case studies in the UK. Most participants reported difficulties in finding and maintaining access to suitable spaces.

Second, managing demand is a major challenge in urban areas. Repair and Reuse initiatives are generally run by small team of mostly volunteers, who quickly become overwhelmed as their projects become successful. Staff are often responsible for a considerable number of people and items needing to be processed, and sometimes experience service users becoming agitated or impatient. Staff have to take account of relevant regulation, social media, paperwork and data entry, all of which requires considerable capacity. Data entry and administrative paperwork were found to be particularly challenging and time consuming.

> *"There's a lot of organic demand, but it's hard to manage"*
> *(Practitioner 6)*

Third, the interviewees also mentioned several skills and training gaps among volunteers. This includes, among other things (a) a need for HGV licenses or qualified drivers for mobile services, (b) customer services skills, and (c) IT skills.

Fourth, multiple interviewees recognised that changes in policy were essential, particularly with regards to tackling built-in obsolescence. As one policy expert pointed out, policy generally moves slowly and tackling built-in obsolescence would require a global effort as so much is imported from outside of the UK. Therefore, it is unlikely that this will be an easy fix. However, the Right to Repair movement was recognised by multiple participants as a great step in the right direction.

> *"Government's role should be to regulate production and inhibiting planned obsolescence"* – *(Practitioner 3)*

Fifth, access to long-term funding and a general lack of resource was found to be challenging by most participants. While it was recognised that there are sources of funding available, multiple participants reported that it was difficult and time-consuming to apply for relatively short-term grants that often take a long time to be processed and come through. For this reason, several participants stressed the need for more long-term funding options. All interviews agreed that

repair and reuse hubs have the potential to be self-sustaining. One participant reported that a permanent repair and reuse shop in an urban area in South Wales is already seeing considerable success with repairs. It was suggested that three years of funding would be an appropriate period to enable community-led repair cafés to become self-sustaining. This would help to employ paid staff to run the repair cafés multiple days per week.

The participants were generally sceptical about top-down run centres and thought that initiatives need to develop organically and be community-led. Communities may be less willing to engage if they feel something is being imposed on them. One practitioner said that a commercial approach could potentially destroy the transformative nature of cafés. A commercial approach was seen as exploitative where it relies on volunteer labour, and as expensive where it uses paid employees. However, as demonstrated by the Edinburgh Remakery, it is possible to run repair cafés commercially while keeping services free of charge.

Some further concerns were expressed about the (potential) exclusion of remote areas, often being tied to broader problems with transportation and isolation. This is covered in more detail in the 'rural and urban' section.

Behaviour Change as an Integral Part of Repair and Reuse

Most practitioners reported that many different groups already engage with repair and reuse, but also made suggestions on how to further increase engagement. The importance of behaviour change was mentioned in all interviews. To get more people 'through the door', practitioners said that repair and reuse needs to be normalised, accessible, and be located in a central welcoming space.

Repair and Reuse initiatives are working against "very complicated, entangled global processes" that encourage fast turnover of fashion, technology, and culture (Policy Expert 1). Consumers must transition from a fast-paced, linear economy to a more connected way of consumption. Repair cafés can be time-consuming and slow, as people have to wait in line and stay with their items. However, as our interviewee from the Edinburgh Remakery pointed out, we do not have decades to change our behaviour in order to address the climate crisis. While CE may not be able to fully stop the linear economy, it can create a middle ground where the end of the life of a product can be delayed. The first step in this process is getting people to not throw away things.

According to a representative of an umbrella organisation, the range of motivating factors must be exhibited to engage different audiences. That is, environmental benefits might attract those concerned about the climate crisis, while economic benefits might attract those more concerned with the cost of living. Because an economic motivation might be stigmatising (Terzioğlu, 2021), repair and reuse needs to be normalised. The Edinburgh Remakery is doing this by locating their shop amongst mainstream shops, such as Costa Coffee, and designing their storefront to look like any other electronic shop.

Placing repair and reuse hubs alongside mainstream shops helps to increase foot traffic, accessibility, and visibility. This is particularly true when they hold repair cafés in their window-lined event space. People are curious about the gathering of people, encouraging them to enter the store and possibly bring an item for the next time. In this way, repair cafés are "changing perceptions through demonstrating on the ground" (Practitioner 3). Nearly every participant in our study said that repair and reuse need to be the easy thing to do – "it is easy to press 'buy new' for a laptop" so it is imperative that repairing an item is just as easy as that. People also need to be able to get to the repair and reuse café or hub, which means placing them on high streets and improving public transportation in rural areas.

Results

Multiple interviewees mentioned gendered and generational divides, which – if bridged – might support behaviour change. For example, it is common for women to do textile repairs while men work on technology or tinker with other items. Also, older generations may get involved in repair cafés because they have skills that they were taught when they were younger. Many of the young people working with repair and reuse initiatives are affiliated with groups such as the Duke of Edinburgh or Youth Philanthropy Initiative.

Multiple practitioners emphasised the need for a welcoming environment so that people want to use repair and reuse hubs. This includes having refreshments for attendees and spaces to socialise. One participant asserted that repair and reuse hubs are a proven way of doing this. They argued that the ideal scenario is where everything is under one roof, with a variety of specialities including vintage clothing, repair, electronics, and waste diversion. It could further include a community garden and café. Items would be diverted from the dump and delivered to the appropriate people for repair, then resold for income generation. It could support people who have barriers to employment and create a vibrant space for people to enjoy themselves.

Finally, incorporating repair into the school curriculum was mentioned as a way to introduce those skills to a younger generation. One interviewee has seen success with this approach. During workshops, children were shown the inner parts of a computer. Many were not aware of the precious metals inside of electronics and demonstrated reluctance to throw such things away. Practitioners found that, for example, watching a computer be dismantled for repair can build confidence to do repairs on their own by demystifying technology and teaching them the skills to do so.

Rural and Urban Differences

One objective of this research was to determine the differences and similarities for establishing repair and reuse hubs in rural versus urban environments. This is partially because of a gap in the literature regarding CE in rural areas, but also because Wales has a sizeable number of rural communities that need to be serviced (Statistical Directorate Welsh Government, 2008). The challenges in rural areas are primarily around accessibility and demand. Urban repair and reuse initiatives tend to have more footfall due to higher population densities. There is less natural demand in less populated rural areas, although people do travel to repair café in so-called 'intermediate' towns. It may be more difficult to specialise in one type of repair in rural areas, as there may be fewer volunteers and/or repair skills available.

There is a potential for socio-economic and/or geographic exclusion in rural areas, while, at the same time, these circumstances may increase the need for CE activities. Options for transportation are limited in some rural parts of Wales, with only 39% of rural Wales having access to a daily bus service as of 2013 and 17% having no access to public transport at all (Woods and Utz, 2021). This may require distinct types of funding and support. It is easier to connect with the community in rural areas and therefore it may encourage more behaviour change and engagement with initiatives. Proposed models that may help address exclusion include a 'hub and spoke' system, where items are delivered to a central location for repair, rotating pop-up events, and a mobile service such as the Borrow Bus.

As noted in the literature review, there are significant benefits to establishing repair and reuse hubs in rural areas in Wales. Increased economic and social opportunities might keep younger generations in rural areas (Woods and Utz, 2022), and repair and reuse hubs can become an environment to help co-create "cultural values, social and economic relations and material outcomes" (McLaren et al., 2020).

Conclusion

Summary

Repair and reuse projects can be established successfully at various scales, from a mobile bus to pop-up repair cafés, and permanent multi-functional hubs. However, different areas experience different challenges. In urban areas, some projects experience heavy workloads due to high demand. This poses significant challenges for small teams of volunteers who run these projects. In rural areas, accessibility and potential exclusion are more significant challenges. Locating mobile services and drop-off points in areas with significant footfall – such as supermarkets – can be an effective way of increasing reach in rural areas, although some concerns were expressed that remote areas are still difficult to reach.

There were also some shared challenges across the different projects covered in this report. First, many practitioners report difficulties accessing space for running pop-up or permanent hubs, and many lack event space and storage facilities. Some projects report significant training and skills gaps, as their work becomes more complex and multifunctional. Problems with repairability were also reported, as built-in obsolescence hinders the ability to repair and reuse items. Practitioners identified multiple avenues of income generation including repair and re-sell, collaboration with the community and other organizations, having highly visible spaces to increase footfall, and methods to obtain donations. However, government support is needed to enable repair and reuse initiatives to become self-sustaining.

Overall, repair and reuse services are in high demand, suggesting there is a need for such services within the community. Behaviour change was reported by all participants as a vital part of the transition to a circular economy.

Conclusion

Sustainable Models for Repair and Reuse Hubs in Wales

One way of achieving sustainable repair and reuse hubs is by bringing assorted services together to create a multifunctional centre in areas with significant footfall. All case studies in this report involved different community actors, NGOs, and sometimes assistance from the government; and provided an array of community and social functions. This emphasises the importance of community involvement, which corresponds with the Welsh Government's aim to empower communities by supporting and building upon existing projects. Successful projects on the ground can inspire the development of new, similar projects. Indeed, many participants reported how their work was inspired by other initiatives.

Umbrella organisations already provide coordination of resources and educational materials, so that working models can be replicated. The case studies further show ways in which income can be generated through the sale of refurbished items. However, it is essential that services are accessible to all, and repairs are free of charge where possible to remain inclusive. The government can play a role in making repair and reuse centres more sustainable. While the third sector can create (and already run) successful and vibrant repair and reuse hubs, long-term funding is needed to establish hubs until they are able to become self-sustaining.

Conclusion

Recommendations

- **Support is needed to identify suitable properties for repair and reuse hubs.** While there are funds available to refurbish buildings in urban areas, many practitioners are still struggling to find suitable locations for their pop-up or permanent hubs. This can be done by making existing community spaces available, helping with funding to cover rent and other costs, and identifying suitable unused properties.

- **Rural and urban areas require different models and support because they have different needs and challenges.** Concerns were expressed in the interviews that remote rural areas often have limited access to repair and reuse services. Rural repair and reuse initiatives can be made more accessible by providing better transport services, appropriate spaces for pop-up events, and mobile services.

- **Support is needed for the development of skills and training of staff and volunteers involved in repair and reuse hubs.** It was found that some projects lack the essential skills and training needed to run repair and reuse projects, especially as demand grows and volunteer roles become more complex. This includes (but is not limited to) customer service skills, IT skills, and driving licenses for mobile services.

- **Long-term funding is needed to enable repair and reuse hubs to become self-sustaining.** The completion of funding applications was found to be a barrier for volunteers, many of whom were already overwhelmed by the success of their projects. Participants reported that funding applications are time-consuming and that it is challenging to complete applications in small application windows, meaning that overstretched volunteers were regularly distracted from the important work they were doing as part of the repair and reuse centres.

- **Long-term policy changes are needed to regulate production. It was recognised that long-term policy changes will be needed eventually**. It was agreed by most participants that this mostly included the regulation of the production of items, to challenge the persistence of built-in obsolescence. The Right to Repair appears to be a step in the right direction and is already being supported by existing repair and reuse projects across Wales and beyond.

- **More research is needed to understand attitudinal and structural barriers to upscaling repair and reuse projects.** While there is already a high demand for repair and reuse services, in particular in urban areas, there are still significant barriers to upscaling repair and reuse initiatives. Further research is needed to identify how attitudes and infrastructure can be adapted to meet growing demand.

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Acknowledgements

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CAST is funded by the Economic and Social Research Council

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