

<b>Institution:</b> University of Chester		
<b>Unit of Assessment:</b> 14 Geography, Environmental Studies and Archaeology		
<b>Title of case study:</b> Reducing the Rural Digital Divide to Change Lives		
<b>Period when the underpinning research was undertaken:</b> 2014 – 2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Fiona Williams	<b>Role(s) (e.g. job title):</b> Dr, Senior Lecturer	<b>Period(s) employed by submitting HEI:</b> 2015 (ongoing)
<b>Period when the claimed impact occurred:</b> 2015 – 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		

### 1. Summary of the impact (indicative maximum 100 words)

The Rural Public Access WiFi Service (PAWS) study and the research activity that followed facilitated digital inclusion in a commercially 'hard to reach' remote rural community - businesses and households that either did not have access to broadband services, or only to services not 'fit for purpose'. Ultimately, the connection of users (rural residents and businesses) to better broadband services was achieved at a local level. The reported economic and social impacts of this connectivity, such as business savings, productivity gains, and enhanced wellbeing, have been used to demonstrate the importance of overcoming digital exclusion in rural areas. Accordingly, the work has made a substantial contribution to UK policy consultation processes, the outcomes of which aid government decision-making to alleviate rural disadvantage in broadband connectivity.

### 2. Underpinning research (indicative maximum 500 words)

Amid a phenomenal pace of technological change, stubborn social, economic, and territorial divides remain between those who are digitally connected and those who are not. In the UK, as territorial remoteness and population sparsity increases, the commercial investment case for broadband provision weakens, thereby increasing the likelihood of those territories having no or very poor broadband connectivity. The households and businesses affected are referred to as 'the final few' [R1, R2]. Against a policy backdrop of UK Government efforts to improve mobile and fixed network infrastructures and coverage, coupled with a prevailing 'Digital by Default' public services agenda, the 'final few' pose a problem. The research project (Rural PAWS) addressed this problem by enabling internet connectivity for a commercially 'hard to reach' rural area (UK) [R1]. A longitudinal evaluation of subsequent internet connectivity experiences and user behaviour has led to a better understanding of the needs and requirements of remote rural users, which in turn has informed broader policy narratives concerned with digital exclusion [R3, R4, R5].

Dr Fiona Williams joined the University of Chester as a full-time Senior Lecturer in Human Geography in February 2016. Prior, Williams was a Senior Post Doctoral Research Fellow (PDRF) on Rural PAWS - a two-year (2013-15) interdisciplinary (Geography and Internet Engineering), University of Aberdeen dot.rural project aiming to facilitate digital inclusion. This project also involved Professor John Farrington and Dr Lorna Philip (Geography and Environment, University of Aberdeen), Dr Althaff Mohideen and Professor Gorry Fairhurst (School of Engineering, University of Aberdeen). A commercially hard to reach rural community in South Shropshire provided the trial case study area, the English context making the project unique in the mainly Scottish dot.rural suite. Narrow sampling parameters required a high degree of local knowledge to recruit suitable participants. Williams, with links 'in situ', proved invaluable in the recruitment and retention of participants - those meeting the study criteria, that is, exhibiting technical connectivity barriers (e.g. inadequate or no broadband provision) and non-technical connectivity barriers (e.g. low levels of computer literacy but with access to family / friends support networks) and collectively illustrating variable remote rural connectivity household and business scenarios. Dot.rural project funding ended in 2015. The University of Chester supported Williams in developing research and evaluation activity extending well beyond the Rural PAWS project funding and remit. A productive publishing relationship with Philip (Aberdeen) was also

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maintained. Support to participating households and businesses, and the longitudinal evaluation of them, was funded and formalised in 2016, via a series of internal (University of Chester) research grants totalling £3,500 [section B3]. Williams, employed by the University of Chester and located in the study area, continued to work with project participants [R4], managing the transition to alternative internet providers and monitoring user practices. Understanding the ongoing needs of users and the shifting landscape of internet provision enabled Williams to engage with, and inform the decisions of, the policy community [R3, R5].

The Rural PAWS project provided participants with free access to a satellite-based, rate-limited (for bandwidth-hungry functions) broadband service. The study examined the extent to which local demand for improved connectivity could be stimulated to bring 'hard to reach' communities online and allow previously digitally excluded people to enter a digital society [R1, R2]. Avanti Communications plc, a global satellite provider, was an industry partner, providing hardware, installation, and bandwidth for experimentation purposes. Satellite broadband technology was deployed at no cost to eight participating households (17 permanent users and four occasional users), previously unserved or underserved by broadband connectivity; six of the participating households ran micro-businesses from home in sectors representative of the community being studied. The subsequent digital behaviour and internet experiences of participants was examined via a series of 'in situ' qualitative household interviews (pre, during and post Rural PAWS deployment plus longitudinal follow-up interviews), user diaries and a researcher diary [R1, R4].

At the outset, the underpinning research revealed significant territorial connectivity barriers in the case study community, with households either unserved or underserved by broadband infrastructure [R2]. The Rural PAWS model uncovered a range of additional digital participation barriers: motivation, levels of digital literacy, perceived utility and value of the internet, and the capabilities and limitations of available internet services [R1]. Initial perceptions of the free Rural PAWS service varied considerably according to household and business context, although on decommissioning Rural PAWS, and with the assistance of Williams, all participants elected to pay to remain connected to a commercial Internet Service Provider (ISP). Demand for digital connectivity was stimulated, benefitting an alternative local service provider [R3]. Significant behaviour change was observed by Williams, aligned with user experiences and the perceived quality of broadband provision [R4]. Participants were highly embedded in the locality (necessarily as a result of rural business activities, or through a strong desire to live in a rural context), negating any option of relocation to areas with better broadband [R4]. Greater utility of the internet, and the perceived added value attributed to internet use, was apparent among household businesses and those working from home. Digital engagement and digital literacy among older generation households was encouraged and enhanced through internet availability. Insights gained by Williams into the changing behaviours associated with internet adoption, use, and progression in the rural context have made a significant contribution to a growing body of academic evidence and associated policy developments [R3, R5].

### 3. References to the research (indicative maximum of six references)

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**[R1] Williams, F.,** Philip, L., Fairhurst, G. Farrington, J. 2016. 'Digital by Default' and 'the hard to reach': exploring solutions to digital exclusion in remote rural areas. *Local Economy* 31, 757-777 <https://doi.org/10.1177%2F0269094216670938>

**[R2] Philip, L.,** Cottrill, C., Farrington, J., **Williams, F.,** Ashmore, F. 2017. The digital divide: patterns, policy and options for connecting the final few in rural communities across Great Britain. *Journal of Rural Studies* 54, 386-398 <https://doi.org/10.1016/j.jrurstud.2016.12.002>

**[R3] Williams, F.** 2018. Digital Connectivity. In Reuschke, D. and M. Domecka. Policy Brief on Home-Based Businesses, *OECD SME and Entrepreneurship Papers*, No. 11, OECD Publishing, Paris. pp. 28-30 <http://dx.doi.org/10.1787/abfe755f-en>

**[R4] Philip, L., Williams, F.** 2019. Remote rural home-based businesses and digital inequalities: Understanding needs and expectations in a digitally underserved community. *Journal of Rural Studies* 68, 306-318. <https://doi.org/10.1016/j.jrurstud.2018.09.011>

**[R5] Philip, L., Williams, F.** 2019. Healthy Ageing in Smart Villages? Observations from the Field. *European Countryside* 11, 616-633 <https://doi.org/10.2478/euco-2019-0034>

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Additional funding: internal University of Chester QR grants totalling £3,500 (2016-19); and some facilitation of activity (2018-19) through the ERDF funded Centre for Environment Science and Technology (CREST@UCS).

### 4. Details of the impact (indicative maximum 750 words)

This project contributes to address wider global concerns surrounding rural disadvantage in relation to digital connectivity. Direct beneficiary groups of the underpinning research and associated dissemination activities include: a) project participants – connected households and businesses (attitudinal change and capacity-building, leading to social and economic wellbeing); b) the wider rural resident and business community in Shropshire who benefitted from market stimulus (for improved connectivity); and c) the policy community in receipt of evidence-based contributions to the policy process.

#### a) Direct impact on project participants

The study had direct and significant social and economic impacts on the eight households / six micro-businesses (17 permanent users and four occasional users) who were provided with broadband access and the facilitation of its use.

- The positive economic benefits of internet connectivity to the micro-businesses are illustrated by a couple who said that “...access to a paid broadband service that meets our requirements [...] it’s revolutionised the way we do things.” Specific efficiency and cost-saving examples include those relating to internet banking and ‘digital by default’ administrative functions, saving approximately £300 p.a. on birth notifications (of pedigree sheep) alone. Specific productivity gains attributable to online marketing and promotion in 2020 are reported to include new customer purchases totalling £3,200 [S1i]. The financial impact reported by this participating micro-business exceeds that estimated in an independent Department for Digital, Culture, Media & Sport (DCMS) Evaluation of the Economic Impact and Public Value of Superfast Broadband (2018), which said “that subsidised coverage raised the turnover per worker of firms by 0.38 percent [...], equivalent to £1,390 in GVA per firm per annum (p.6) [S1ii].
- Behaviour change is evident. The project facilitated upskilling in the digital literacy of participants through broadband access and device use. All participants, including older generation households, remained online, transitioning to a paid alternative internet service. Broadband use has become part of the household norm, increasing (subjective) personal wellbeing through browsing, internet shopping, and staying in touch [S2i]. An older generation beneficiary provides examples of how internet access and use can overcome feelings of isolation, particularly through video-calling family members: “We speak every day and it makes such a difference to ‘see’ each other – it lifts both of us” [S2ii]. Some evaluations quantify the wellbeing uplift associated with a subsidised upgrade. For instance, an Ipsos Mori report for DCMS (2018) equates this as “... equivalent to £222.25 per year for the average premise” (Subjective wellbeing analysis of the Superfast Broadband programme, Annex C p.4) [S2iii].

#### b) Local-scale impact on the wider resident and business community in rural Shropshire

The provision of free, rate-limited broadband to local households enabled participants to overcome barriers of access and literacy that had previously excluded them from digital engagement. Through demonstrating opportunity, and potential to overcome barriers, the study created an appetite for better broadband, and stimulated the market. During the initial project phase, the study area in south-west Shropshire (SY7 8 postcode area) was not part of a Broadband Development UK (BDUK) phased ‘intervention area’ to improve access to fixed-line broadband. However, at the end of the study, residents and businesses in this location were eligible for the Better Broadband Scheme (2015-19), which subsidised the installation and access costs of alternative broadband provision. Williams stimulated uptake of the voucher scheme in this area, with the commercial provider Secure Web Services (SWS) being the main beneficiary, as evidenced by Connecting Shropshire and SWS data [S3]. The free Rural PAWS provision ceased in July 2016 (nine months after the dot.rural PAWS project end) and supported by Williams, project participants then secured alternative broadband provision [S1, S2]. Wider awareness of the Better Broadband Scheme support subsidy, and the services offered by SWS, was generated through word-of-mouth recommendation [S3iii].

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- 156 voucher applications were processed by Connecting Shropshire for the SY7 postcode area in the 12-month period August 2016-July 2017, 44 of which were coded to the SY7 8 postcode (study) area [S3i].
- Of the SY7 8 postcode applications, three-quarters (n=33) of the subsidised broadband connections were installed by the commercial provider SWS in the post-PAWS 12-month period August 2016-July 2017 [S3ii].

**c) Evidence-based contributions to national policy**

Since 2016, Williams has disseminated the work via nine international conference / research meeting presentations and two invited Economic and Social Research Council (ESRC) seminars [R3, R4]. Dissemination, and corresponding publishing activity, has underpinned a number of evidence-based policy contributions, the recommendations of which have recognised the barriers to digital inclusion, and called for the improvement of digital services to remote rural areas. The contribution and corresponding impact of Williams's research can be evidenced as follows:

- At an international scale, Williams provided evidence for the Organisation for Economic Co-operation and Development (OECD, which comprises 35 countries worldwide) in their Policy Brief for Home Based Business [R3]. The research was used as a case study (referenced at p30), with the OECD report identifying 'digital connectivity', the provision of fast, affordable broadband, as 'crucial' if the diverse home-based business sector is to participate and thrive.
- Williams provided an expert interview for the Public Health Wales NHS Trust and Mental Health Foundation (2019) report, 'Supporting farming communities at times of uncertainty – An action framework', with a notable contribution to Key challenge 3: Regulation, administration and digitalisation. Recommended actions identified for prevention and protection, include "...the provision of fast internet connectivity, especially in rural areas, alongside addressing gaps in digital skills and literacy" (p14) [S4].
- The research contributed to the House of Commons Select Committee (2019) update to the Broadband and digital-only services inquiry (2015), via written evidence provided by Williams's co-author Dr Lorna Philip [S5i] and referenced at paragraphs 22 and 25 in the House of Commons report (published 18 September 2019) [S5ii]. The 2019 update recommends *that "the Government honour its commitment to its 'outside-in' approach to ensure hard to reach rural areas are prioritised"* (paragraph 67); *"Any new digital public service platforms should be trialled and assessed by rural stakeholders prior to roll out to ensure they are user friendly"* (paragraph 31); *and that "the Government commit to an immediate review of the USO [Universal Service Obligation of 10 Mbps] as soon as possible to ensure it is suitably ambitious for rural areas"* (paragraph 47) *so the USO is not obsolete soon after introduction.*
- Expert witness Professor Claire Wallace (University of Aberdeen) provided oral evidence [S6i] to the House of Lords Select Committee on the Rural Economy (2018). Drawing on Williams's research findings [R1, R2], the evidence was referenced in the Select Committee report (published 27 April 2019) 'Time for a strategy for the rural economy' (chapter 4 of Digital connectivity, paragraphs 242 and 243) [S6ii]. Related conclusions contributed to the House of Commons Select Committee 2019 update and recommendations (above, [S5ii]) including: upload and download speeds were too modest in the USO commitment; and local and national governments must do more to realise the potential of improving digital skills in rural areas.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

**[S1]** (i) Testimonial from a business partner, dated November 2020. (ii) Figures obtained from an Independent report by Ipsos Mori for DCMS evaluating the economic impacts and public value of the Superfast Broadband Programme (2018) (Superfast Integrated Report p.6): <https://www.gov.uk/government/publications/evaluation-of-the-economic-impact-and-public-value-of-the-superfast-broadband-programme>

**[S2]** (i) Testimonial from a community resident, dated November 2020. (ii) Testimonial from a retired farmer, dated November 2020. (iii) Figures obtained from an Independent report by Ipsos Mori for DCMS evaluating the economic impacts and public value of the Superfast Broadband Programme (2018) (Superfast Integrated Report, p.7 and Annex C – Executive Summary, p.4):

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<https://www.gov.uk/government/publications/evaluation-of-the-economic-impact-and-public-value-of-the-superfast-broadband-programme>

**[S3]** (i) Testimonial (Annex 1) and voucher scheme data obtained (June 2020). Point of contact, Connecting Shropshire Programme Manager, Shropshire Council:

Timescale	Postcode	Applications	Codes issued
Dec 2015 – July 2016	SY7	46	45
Aug 2016 – July 2017	SY7	156	152

Timescale	Postcode	Applications	Codes issued
Dec 2015 – July 2016	SY7 8	21	21
Aug 2016 – July 2017	SY7 8	44	44

(ii) SWS installations data obtained June 2020. Point of contact, Managing Director, SWS Broadband:

Timescale	Postcode	Applications	Codes issued	SWS Installations
Dec 2015 – July 2016	SY7	46	45	18
Aug 2016 – July 2017	SY7	156	152	72

Timescale	Postcode	Applications	Codes issued	SWS Installations
Dec 2015 – July 2016	SY7 8	21	21	10
Aug 2016 – July 2017	SY7 8	44	44	33

(iii) Testimonial from a community resident and customer, November 2020.

**[S4]** Davies AR, Homolova L, Grey CNB, Fisher J, Burchett N, Kousoulis A (2019). Supporting farming communities at times of uncertainty: an action framework to support the mental health and well-being of farmers and their families. Cardiff: Public Health Wales NHS Trust & Mental Health Foundation (see inside cover and pp.13-14):

<https://www.mentalhealth.org.uk/sites/default/files/Supporting-farming-communities-at-times-of-uncertainty.pdf>

**[S5]** (i) Written evidence to Commons Select Committee Rural Broadband Inquiry Update (2019) University of Aberdeen (RBD0016)

<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environment-food-and-rural-affairs-committee/rural-broadband-and-digital-only-services/written/103213.html>

(ii) House of Commons Environment, Food and Rural Affairs Committee, An Update on Rural Connectivity (2019). Evidence in Section 3 Digital Public Services in Rural Areas (Paragraphs 22, 25) and outcomes in Conclusions and recommendations (Paragraphs 31, 47, 67).

<https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/2223/222302.htm>

**[S6]** (i) Oral witness evidence provided to the House of Lords Select Committee on the Rural Economy, University of Aberdeen (published research identifiable: Q174, Q177, Q178, Q183).

<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/rural-economy-committee/rural-economy/oral/92944.html>

(ii) House of Lords Select Committee, Time for a strategy for the rural economy' 2019 (Evidence in Chapter 4 Digital connectivity, Paragraphs 242, 243) and outcomes in Summary of conclusions and recommendations (Paragraphs 278, 304).

<https://publications.parliament.uk/pa/ld201719/ldselect/ldrurecon/330/33002.htm>