The Role of Internet Connectivity in Inward and Outward Migration of Rural and Remote Australia

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Abstract

Equitable access to high-speed internet connectivity is critical to participation in modern society regardless of your physical location. As services such as banking, health, shopping, education and participation in political discourse increasingly move online and away from a physical presence, individuals with poor or inadequate internet connectivity are unfairly affected. This digital divide not only exacerbates existing inequalities but also limits opportunities for economic growth and social mobility, making it essential for policymakers to prioritise infrastructure development in underserved areas. Since the United Nations (UN) declared access to the internet a basic human right in 2003, improvements to internet connectivity that is available to residents and businesses in rural, regional and remote (RRR) areas of Australia have been made. However, these improvements have typically focused on the availability of an internet connection, rather than its adequacy. As a result, whilst the residents of RRR areas in Australia have guaranteed access to internet connectivity, this access is not equitable when compared to their urban counterparts. In addition, the tyranny of distance and isolation experienced by the residents of rural and remote Australia make face to face social interactions particularly difficult, especially for minorities. These feelings of isolation are exacerbated for new residents including urban Australians and migrants. This chapter examines the role of internet connectivity in the phenomenon of outwards migration from rural and regional areas and the role of improved internet connectivity in attracting and retaining residents including migrants into regional and remote Australia.

Keywords

Broadband · Adequacy · Rural · Migration · Connectivity · Technology · Infrastructure · Telecommunications

11.1 Introduction

While COVID19 saw a reduction in migration, the international travel- ban was lifted in 2021–2022 (Department of Home Affairs [DHA] 2023). As a result, in the next reporting period there was a larger than normal increase in migration (DHA

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2023). In 2022–2023 the Department of Home Affairs (Australian Government 2024, p. 3) cited that overall regional migration in Australia had increased by 86.3% compared to 2021/22 (DHA 2023). However, from 2013 to 2023, the number of permanent places for migrants has increased by 4.4% and the number of temporary visa's had increased by 3.0% (DHA 2023, p. 3). More recently, the Australian government has reduced the annual intake of migrants (DHA 2024b).

While migration can address issues such as population and skills shortages, the settlement of migrants into regional Australia comes with the same challenges as experienced by all residents of RRR areas. The challenges of rural disadvantage are discussed widely in the extant literature, with examples including limited availability or lower quality of services, poorer infrastructure, limited employment opportunities, social and cultural isolation and other disadvantages (Tonts and Larsen 2002; Townsend et al. 2013). For migrants, these challenges are exacerbated by low English language levels, limited access to cultural and religious needs, racism, and stereotyping (Federation of Ethnic Communities' Councils of Australia [FECCA] 2015). Whether or not migrants stay in regional locations is often reflective of their actual experiences at that location, which is shaped by "policies, employment and other place-based dimensions of settlement and their anticipation of future experiences in the same or a different location" (Boese 2023).

Many migrants arrive in Australia on skilled regional visas which are designed to attract migrants to designated regional areas where there are skills shortages, and in some cases, migrate with their families (Boese 2023). Two categories of designated regional areas exist: (1) Category 2: cities and major regional areas; and (2) Category 3: regional centres and other regional areas (DHA 2024a). Due to their high skill level, many migrant workers and their families have previous experience with high-speed internet connectivity that may not be available in RRR areas in Australia. Poor connectivity may result in migrant workers being unable to work productively in RRR areas, and it can also make it difficult to attract and retain staff as a result of the digital divide (Dolnicar et al. 2004). The resulting digital divide between those who can fully benefit from online services and opportunities, and those who cannot, significantly impacts migrants' ability to settle into regional areas and participate fully in their new communities.

Category 3 regional areas are more geographically remote and as a result often have lower socio-economic status and more commonly have limited or poor infrastructure leading to more inequitable access to reliable, high-speed internet than those in the Category 2 regions. This lack of equal access can result in disparities in education, employment, healthcare, and social participation (Holden and Zhang 2018; Park 2017; Tonts and Larsen 2002; Whitacre et al. 2014; Willis and Tranter 2006). Inequitable access to the internet can lead to residents and marginalised groups such as migrants in RRR areas becoming more isolated as these groups rely on the internet to keep connected to online activities and with family and friends.

Migrants living in regional areas are not the only ones facing inequitable access to the internet with local residents of RRR areas also experiencing challenges with data allowance, reliability and pricing barriers (Park et al. 2019). Other challenges in RRR areas include job shortages for partners and lack of access to employment services (Boese 2023). Together, these may result in migrants, that settled in RRR areas, and local populations seeking opportunities outside of regional towns.

Ultimately, the out migration away from rural areas to areas with improved connectivity or other services results in a phenomenon often called a brain drain (Bowen and Morris 2019; Townsend et al. 2017). The brain drain phenomenon describes the migration of young people away from rural or regional areas towards urban areas. Regardless of the exact cause of this phenomenon, the resulting effects on rural communities are the same, i.e., a reduction in the sustainability of rural communities (Commission for Rural Communities [CRC] 2009) and a reduction of services including business, community, education and health (Bowen and Morris 2019; CRC 2009; Townsend et al. 2017). The

Good Things Foundation recently cited that "Digital exclusion of many new migrants and refugees was due to multiple factors relating to affordable access to technology and internet connectivity, the lack of digital skills, as well as language barriers" (Good Things Foundation [GTF] 2021).

These findings are also supported by the Australian Digital Inclusion Index (Thomas et al. 2023) where recent research has found that while Australia's Culturally and Linguistically Diverse (CALD) migrant population records a relatively high level of digital inclusion, recently arrived CALD migrants are faring less well (Thomas et al. 2019).

As we embrace the digital economy, regional areas need to have equitable access to the internet to participate in digital only services and access information, banking, health, business, shopping, education and to participate in political discourse. In addition, having access to the internet can lead to less social isolation and anxiety (Felton 2014).

11.2 Internet Connectivity in Rural, Regional & Remote (RRR) Areas

Internet connectivity is an integral part of life in today's world with fast and reliable internet connectivity being taken for granted by many people. Without internet access: "Which facilitates economic development and the enjoyment of a range of human rights, marginalised groups remain trapped in a disadvantaged situation" (Australian Human Rights Commission [AHRC] n.d.).

Internet connectivity is arguably more important in RRR areas where the population is isolated and has access to fewer services relative to urban areas. Despite this, RRR areas have been the most excluded from access to high-speed internet connectivity and yet they have the most to benefit from such services (Townsend et al. 2013). Internet connectivity: "… enables the free and efficient exchange of information [and] removes the barriers of time and space" (Federal Communication Commission [FCC] 2010, p. 193).

… and without adequate internet connectivity any benefits are, at best, only able to be partially realised (Mandel et al. 2012). Poor connectivity is not just affecting residents of towns, it is also limiting agricultural development in regional and remote regions of the world, limiting the adoption of new technology and new approaches to farming (Charmley et al. 2016; Lamb et al. 2008, 2018; Rango et al. 2011). This inequitable access to the internet is commonly referred in the literature as the digital divide (Dolnicar et al. 2004).

There have been numerous attempts to define the digital divide in extant literature. Examples of these include Furuholt and Kristiansen (2007), who consider the digital divide as: "The gap between those with regular, effective access to digital technologies, in particular the Internet, and those without" (p. 1).

Alternatively, van Dijk (2005) views the digital divide as consisting of four components. These components are "motivational access", "material or physical access", "skills access" and "usage access (number and diversity of applications and usage time)" (p. 21). Collectively these definitions describe a phenomenon where different groups have different levels of access to the internet.

The importance of internet connectivity to residents of RRR areas has been recognised by governments around the world with significant investments being made (Kandilov et al. 2017; Taylor 2018). Examples of these efforts include the United States Department of Agriculture (USDA) Broadband Loan Program in the United States of America (USA) (Kandilov et al. 2017), the Broadband for Rural and Northern Development (BRAND) program (Taylor 2018) in Canada and Australia's own National Broadband Network (NBN) program (NBN Co 2020).

These programs all share the common goal of improving broadband for RRR residents. They also share the large costs involved in providing telecommunications infrastructure, as installing these services in RRR areas is typically more expensive per user than in urban areas due to large distances and low population density. Anecdotally, these programs are also generally inflexible in how they are delivered, i.e., the actual

service delivery can seem somewhat arbitrary and ineffective.

Investment in infrastructure programs can also have perverse outcomes. Subsidising commercial internet connectivity for rural areas where there is a very low level of population density increases costs for alternative local Internet Service Providers (ISPs). This makes it difficult for these alternate ISPs to compete against other businesses that have been subsidised and may result in delayed or impeded installation of better services by these local companies or force the installation of services that pass the costs onto consumers, perversely contributing to the digital divide. Therefore, rural residents, including migrants, tend to accept the prevailing offering, e.g., stay with a lesser quality higher cost service, regardless of whether a service is actually better or not.

As a result of these challenges, many internet services in regional Australia are subsidised or otherwise supported by governments. Australian examples include the NBN and the Regional Connectivity Program (RCP) (Department of Infrastructure Transport Regional Development Communications and the Arts [DITRDC] 2024) that provide funding to ISPs to deploy infrastructure in RRR areas. These programs benefit the residents of RRR areas by reducing the cost of internet services in RRR, increasing affordability for migrant workers and families as well as other residents of RRR areas. Albeit that subsidised programs can also have the unintended consequence of reducing the commercial value for smaller ISPs to offer services in these RRR areas.

As an outcome of infrastructure programs, the introduction of the NBN's SkyMusterTM satellite service through the Universal Service Guarantee (BIRRR 2021) and other commercial satellite services such as StarlinkTM, internet connectivity in RRR areas has become much more available. However, it is not enough to only consider the availability of internet connectivity or the assumption that simply having access to the internet is both a necessary and sufficient condition for adequate internet connectivity (Roberts and Hernandez 2019).

Geographical isolation, low population density and slow uptake have been identified as factors that make supplying internet connectivity to residents of RRR areas difficult (Hartsuyker et al. 2021). As such, non-fixed line services which are supplied in geographically isolated regions typically do not perform as well as services that are physically connected to the internet user (DITRDC 2024). Performance of non-fixed line services can be affected by reduced or expensive backhaul capacity, i.e., the subnetwork that connects these data centres to local exchanges (Department of Primary Industries and Regional Development 2018). Poor access to backhaul ultimately leads to internet connectivity offerings for residents in RRR areas to be generally slower than what is available to urban residents. Because backhaul is expensive or has limited availability, internet services are also restricted by lower data limits (Regional Telecommunications Independent Review 2018). In addition, geographical isolation adds to the cost of internet for RRR residents.

Historically, residents of RRR areas have limited options to connect to the internet due to a basic lack of telecommunications and internet infrastructure (Marshall et al. 2020; Willis and Tranter 2006). Over the past five years the internet connectivity options available to RRR residents have increased and now include services such as Sky Muster PlusTM (NBN Co 2021), SpaceX's StarlinkTM constellation and local Wireless Internet Service Providers (WISPs). As a result, residents now have the ability to access internet connectivity with no data limits and in some cases with latency less than 100 ms. Latency is the time it takes for data to travel from the users device to a server on the internet and back. However, uptake of the improved services has been limited.

The most common internet service used by residents of RRR Australians (Better Internet for Rural, Regional and Remote Australia [BIRRR] 2017) is the NBN Sky MusterTM satellite service due to its ability to service the whole Australian continent (NBN Co 2021). Other services such as Asymmetric Digital Subscriber Line (ADSL)

or cellular (mobile) services are also available in most communities. Higher speed services such as fibre to the premises where a fibre optic cable connects a premises directly to an exchange are less commonly available in RRR areas. In addition, the higher cost of some of the better performing internet services are less accessible to many residents of RRR areas, particularly for low-income earners and other lower socioeconomic groups such as migrants (Wise 2014).

Digital connectivity allows for social bonds to flourish. In the case of migrants, technology allows them to maintain contact with friends and family in their homeland, reducing feelings of family separation and increasing wellbeing (Baganz et al. 2024). Technology may also assist with communication where there are language barriers; however, issues of access, confidence and security also affect remote communities, migrants and marginalised groups (AHRC n.d.). The internet:

> ... offers a key means by which such groups can obtain information, assert their rights, and participate in public debates concerning social, economic and political changes to improve their situation. [However, these disadvantaged groups often face barriers (high costs, deficient ICT infrastructure and socioeconomic challenges) to accessing the Internet in a way that is meaningful, relevant and useful to them in their daily lives. (AHRC n.d.)

Generally, migrant workers are paid less compared to the population as a whole. In 2019–2020 the median annual personal income for migrant workers was $45,351 per annum compared with $52,338 for the population as a whole. As such cost has a high impact factor for low-income families. According to the Australian Digital Inclusion Index (ADII), CALD migrants in Shepperton (which is a Category 3 area) recorded an affordability score of 15.9 points below the national average, demonstrating a high impact of connecting to the internet on household budgets (Thomas et al. 2019). As such, there is a critical need for targeted initiatives to bridge the digital divide and ensure full inclusion for all, particularly those from culturally and linguistically diverse backgrounds and lower socio-economic status.

Despite the importance of internet connectivity in modern day life, the issue of "getting connected" and "staying connected" to the internet, coined as connectivity literacy, has only recently begun to be explored (BIRRR 2021). The concept of "connectivity literacy" was first developed by Kristy Sparrow, the co-founder of BIRRR and was published in Hartsuyker et al. (2021) who defined connectivity literacy as "the skills and knowledge needed by a consumer to get connected and stay connected to telecommunications services" (p. 9).

For recently arrived migrants with poor connectivity literacy, and in some cases, challenges with English as a second language (ESL) it can be difficult for them to obtain an internet connection that meets their needs and is adequate or fit for purpose. Several different options are available to residents of Australia to connect to the internet, including different suppliers, pricing, reliability and performance and understanding these options can make it challenging to migrants to obtain an internet connection that meets their needs. It is currently unknown how these challenges affect the ways in which migrants get connected and stay connected to the internet.

11.3 Demographic Effects

It is also important to make a distinction between having access to the internet and the adequacy, or capability, of the internet connection meets an individual or an organisation's needs (Roberts and Hernandez 2019). There are many cases where this distinction is not made, including by policy makers, technology providers and in academia, resulting in an assumed equity when discussing internet connectivity in RRR areas.

For residents of RRR areas, inequitable access to adequate fit for purpose internet connectivity can have many unintended consequences. In such cases where RRR businesses are attempting to compete against their city counterparts for resources, their lack of access to equitable internet services is causing them to lose their competitive edge (Philip and Williams 2019). This results

in people leaving regional areas and it makes it difficult for businesses to find workers and is ultimately leading to a cycle of population decline (Milbourne and Kitchen 2014).

Population decline is a long-standing movement in Australia of younger people migrating to the city (Regional Australia Institute 2015). Australia is far from alone with many other nations including the United Kingdom (CRC 2009) experiencing a similar phenomenon. In addition, the migration of younger people away from rural areas causes many younger people to lose connection with their "rurality" (Rousseau 1995) and "sense of place" (Stedman 2002). This loss of connection and coupled with changed expectations relating to management of the family farm and also makes succession planning difficult (Sappey et al. 2012).

Technology, and by extension, improved internet connectivity can provide an incentive for younger people to remain in RRR areas and on farms (Hay 2018). An extreme example of this effect can be seen in Japan where farms are lying fallow as young people migrate away from farming areas (Yamashita 2008). The ongoing rural population decline also contributes to a cycle that reduces the justification to provide services such as good internet connectivity in RRR areas (McManus et al. 2012). This ongoing decline and loss of services also makes RRR areas less appealing for migrants and other residents to move to.

Although not the only factor, reduced equity of services may also contribute to residents in rural Australia having shorter lives, higher levels of disease and injury and poorer access to and use of health services, compared with people living in metropolitan areas (AIHW 2025). Is it challenging to reverse the migration away from RRR areas as it is difficult for young people to return to RRR areas after becoming accustomed certain levels of internet connectivity (Marshall and Dale 2019). This is an important consideration for migrants as to whether they stay or leave RRR areas will also be influenced by these same issues.

Residents of rural areas that are unable or unwilling to use social media services are not necessarily socially isolated (Townsend et al. 2013). This can be due to many reasons, including a strong sense of community in RRR areas and the need to seek support from other residents of the community instead (Raymond et al. 2010). Conversely, Townsend et al. (2013) also argues that people who do not fit into the community, such as those that belong to minority groups such as migrants, and who do not or cannot use social media, may ultimately experience more extreme isolation in RRR areas. This is supported by numerous studies including Escobar-Viera et al. (2022), Karim et al. (2022) and OConnor et al. (2018) who observed residents of RRR areas that were members of various minority groups due to their age and sexual or gender identity.

Services such as telehealth that are delivered over the internet are helping to supply access to medical professionals and improve medical services. However, inadequate internet connectivity creates barriers to for the RRR community to adopt these services (Gunn et al. 2021; Maloney et al. 2022). Internet connectivity is also a key enabler to the democratisation of policy issues, which can influence perceptions and attitudes that are relevant or related to migrants and other minority groups (Willis and Tranter 2006). Lamb et al. (2015) and Cosby et al. (2019) add that internet connectivity is reducing the ability of students in remote areas to access educational services (Cosby et al. 2019) such as learning English.

11.4 Conclusion

This chapter examined the role of internet connectivity in attracting and retaining residents including migrants in regional, rural and remote Australia. Migrants are an extremely important part of the Australian economy, particularly in RRR areas where they are key to solving the skill shortages in Category 2 and Category 3 geographical areas. In many cases, highly skilled migrants are accustomed to high-speed internet connections that are often not available in RRR Australia. The inequitable access to high-speed internet in RRR areas increases risk of isolation and marginalisation of these migrants and other

residents and contributes to a cycle of migration towards more urban areas. There is a critical need for targeted initiatives to bridge the digital divide and ensure full inclusion for all, particularly those from culturally and linguistically diverse backgrounds and lower socio-economic status.

Future funding to build capacity and strengthen resilience and adaptation of RRR areas should support investment that results in resilient, advanced and future proofed infrastructure. Regional development investment should focus on building sustainable communities, including liveability, through adequate internet connectivity to support digitisation and AI to empower RRR communities including migrant workers and their families to close the gap on the digital divide.

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