



## Social networks and other forgotten components of the WaSH enabling environment in Fiji

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### ABSTRACT

Pacific Island countries have among the lowest access to improved drinking water sources and sanitation services in the world. Due to geography, climate, the high frequency, and severity of disasters, transportation difficulties and resource constraints, government and private sector support to rural populations are limited and likely to remain so. However, the unique demographic characteristics of the region see considerable support flowing to rural areas from village kin in urban centres and overseas, hinged on strong socio-cultural norms of reciprocity, self-help, and obligation. Focusing on Fiji, this paper examines how select social networks are being used to support improved rural water and sanitation outcomes. Results demonstrate that kinship-orientated urban–rural linkages, select customary norms, relations and practices, common interest associations (such as village development committees), and select social media groups, all constitute critical components of the WaSH enabling environment in Fiji. Given the unique character of the Pacific Islands region, leveraging existing social networks to support improved rural water and sanitation outcomes may constitute a fruitful community water management ‘plus’ strategy for both governments and non-government organisations seeking to strengthen rural water and sanitation service outcomes.

**Key words:** Adaptive capacity, Social networks, Water and sanitation services

### HIGHLIGHTS

- This is the first study of the relationship between social networks and WaSH in the region.
- ‘Hybrid’ village development committees are an innovative response to social, economic, and environmental changes.
- Social media groups are an important post-disaster buffer, providing adaptive capacity to respond to emergency WaSH needs.
- Rural water and sanitation services in Fiji have been improved through leveraging social networks.

### INTRODUCTION

Pacific Island countries (PICs) have the lowest access to improved drinking water and sanitation services in the world; only half of the population uses basic drinking water sources and only one-third have basic sanitation (United Nations, 2021). Government and private sector water services to rural populations are limited, inhibited by not just human and financial constraints but also geography (the dispersed and remote location of rural

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communities), transportation difficulties, limited access to resources and markets, and high vulnerability to natural disasters and climate change (Hadwen *et al.*, 2015; Fleming *et al.*, 2019). Consequently, community-based water management (CWM) is the dominant model for rural water service delivery as reflected in many Pacific government policies. However, evidence from the Pacific and elsewhere indicates that basic models of CWM, in which communities have full responsibility to manage water systems after their installation, typically have low sustainability and limited scalability (Clarke *et al.*, 2014; Bond *et al.*, 2015; Hutchings *et al.*, 2015; World Bank, 2017). This leads to poor water, sanitation, and hygiene (WaSH) outcomes, such as inadequate accessibility, quality, and reliability of water (Hutchings *et al.*, 2017; Love *et al.*, 2021).

The community water management plus (CWM+) model is considered a viable improvement to the basic CWM model (Baumann, 2006; Hutchings *et al.*, 2015, 2017). The CWM+ approach includes long-term, ongoing support from external organisations or people following the initial handover of water infrastructure to a community. Pacific governments appreciate that further support is required to ensure good CWM and improved water services for rural populations. Previous CWM+ research has identified a range of factors that influence 'good' CWM outcomes; however, the unique context of PICs requires rigorous place-based evidence about which approaches are most feasible and effective in the region.

In many PICs, the rural 'village' extends well beyond its physical borders. Extensive out-migration (permanent and circular) has resulted in many people living elsewhere – typically in major urban centres – yet they remain heavily invested in their rural 'home' village. Population growth and rural–urban migration in PICs are among the highest in the world, and combined with the region's acute demographic 'youth bulge' raises significant development challenges for the region (Keen & Barbara, 2015; United Nations Human Settlements Programme, 2020). In Fiji, for example, over the last 30 years, urban growth rates have consistently averaged nearly twice the annual population growth rate (World Bank, 2021). While poverty rates are typically higher in urban centres relative to rural areas (Gounder, 2013), the promise of job opportunities and access to improved education and health services fuel high levels of 'urban-drift' (Byrant-Tokalau, 2012).

There are strengths and opportunities in these demographic trends at both the rural and urban levels (Vunibola & Scheyvens, 2019). Cultural norms of reciprocity, obligation, cooperation, and self-help are widespread across the region, resulting in the flow of not just people but ideas, goods, and money from town to village and village to town. These interconnections are materialised in mobility patterns, domestic remittances, fundraising drives, and other forms of tangible and not-so-tangible self-help that, when combined, ensure a degree of social protection (Mohanty, 2012). In Fiji, the social networks through which these forms of self-help are manifest constitute an integral part of the local 'enabling environment' and thus stand as a potential CWM+ mechanism.

Specific examples of these norms of support in the Fiji context include *solesolevaki*, *solu*, and *kerekere*; customary forms of collective self-help, reciprocity, and giving, which promote social cohesion, support, and good relations within (and beyond) family, tribe, and the community. *Solesolevaki* explicitly involves the exchange of collective labour, *solu* [gift, give, or offer] refers to gifting money or goods – usually for some common purpose (cf. Gatty, 2009: 234) – while *kerekere* [literally 'please'] is a form of 'customary borrowing' that refers to requesting goods or services from a relative (cf. Belshaw, 1964: 121). These terms point to the centrality of family (kinship), locality/place, and networks as critical variables of local social capital.

### Social capital and/as social networks

Social capital points to an intangible social variable that can both positively and negatively influence development inputs (Dhesi, 2000). Precise definitions vary but for our purposes, social capital can be understood as a bundle resource that are embodied in relations between people and comprises various socio-cultural particulars, including systems of mutuality/reciprocity, networks, values, norms, and trust (Putnam *et al.*, 1993). A distinction

is often made between ‘bonding social capital’ (horizontal and within a community) and ‘bridging social capital’ (vertical and between communities). In Melanesia, ‘bonding capital’ is considered extremely high but to the detriment of almost everything else (Reilly & Phillpot, 2002).

The bonding social capital aspects of Pacific Islands culture have often been viewed as the cause of a suite of socio-economic and political ills, e.g., a driver of corruption, a contributor to state fragility, and a root cause of economic stagnation. This critical view reflects a widely circulating argument that argues that social capital based on kinship, clan, or tribe harms development because the family-based ‘radius of trust’ is narrow and inward-looking, working against the emergence of broader societal coherence and economic development (Brown, 2007). The roles of *solesolevaki*, *solu*, and *kerekere* – and the place of culture more broadly in development – are complex and hotly debated. Many indigenous Fijians, for example, feel ‘traditional’ values that prioritise social relationships [*viewekani*] are being eroded in favour of Western individualism, while others see such ‘traditional’ practices and values as detrimental to economic advancement (Farrelly & Vudiniabola, 2013; Delaibatiki, 2015; Movono & Becken, 2017; Tavola, 2017). These debates are mirrored in the Solomon Islands with regard to what is referred to as the ‘wantok system’ (Fukuyama, 2008; Brigg, 2009; Haque, 2012). Nevertheless, it cannot be ignored that in PICs, such ‘bonding capital’ provides an important societal safety net and is an enabler of mutual cooperation in the absence of strong state service delivery (Brown, 2007; Boege *et al.*, 2008; Brigg, 2009).

Our position is simply that development actors and agencies must take local values and practices seriously and work with, rather than against, local realities. This is not the same as passive accommodation or uncritical acquiescence. As Farran (2009) argues, working within the grain of local social norms and practices can take the form of a ‘middle-ground approach’ that searches for the commonalities between the view that rights and social inclusion represent a foreign imposition and another that sees rights as locally extant but given effect in culturally specific ways. Calls for ‘working with the grain’ in community development – including in water management – have become increasingly common (Day, 1998; Booth, 2012; Levy, 2014; Whaley *et al.*, 2021). However, in PICs development, actors have been slow to explore such avenues. The approach taken herein is not to elide the complexities and challenges that exist with ‘working with the grain’ but to apply a strength-based approach that explores how the aforementioned cultural norms coalesce (or not) to support community water and sanitation outcomes in rural Fiji.

### Networks and the WaSH enabling environment

Shields *et al.* (2022) argue that WaSH practitioners have held a fixed, static, and ideal picture of the WaSH enabling environment and how it shapes WaSH outcomes in a targeted population/area. Shields *et al.* (2022) highlight that WaSH beneficiaries are a critical part of the enabling environment – agentive actors not simply passive recipients – yet are frequently omitted when defining the enabling environment. Writing from their WaSH experiences working in informal settlements in the Solomon Islands, Vanuatu and Fiji, the authors note that ‘[i]t became evident that enabling actors were not necessarily external, as residents with formal or informal leadership roles in settlements are influential in enabling WaSH actions’ and propose an alternative conceptualisation that views the WaSH enabling environment as a ‘dynamic ecology of actors, relationships and processes (‘participatory collectives’)’ (Shields *et al.*, 2022). In this paper, we provide support for this proposition, offering clear evidence of how specific social networks, hinged around place-based identities and manifest through urban–rural linkages, are indeed essential components of the WaSH enabling environment.

There are a growing number of applied research and development programmes utilising social network analysis (SNA) in the WaSH sector. Many of these studies have focused on integrated water management (Rathwell & Peterson, 2012; Salajegheh *et al.*, 2020; Nabiafjadi, *et al.*, 2021). The goal of our research was not to conduct

a formal SNA *per se*, that is, gathering data and representing networks of people as graphs and then statistically exploring these graphs to understand the social structure and interdependencies of individuals, households, or organisations (Wasserman & Faust, 1994). A formal SNA would be beneficial but was beyond this study's scope and resources. Our goal was to conduct a scoping study of urban–rural linkages, with a focus on informal rural development assistance in WaSH. In this sense, we were animated by Henry & Vollan's (2014) proposition that understanding social networks is central to three key challenges of sustainability science: (i) how to link knowledge with action; (ii) how to enhance collective action; and (iii) how to promote social learning. The networks examined herein demonstrate that they can and do address these three sustainability challenges.

A key enabler of social networks across the global south has been mobile telephony and greater digital connectivity. Under the broad rubric of Information Technologies for Development (ICT4D), there have been numerous efforts to explicitly use digital technologies for social betterment (Walsham, 2017). This includes the WaSH sector, where practitioners have attempted to use ICTs to advance WaSH-related data collection, enhance service delivery and accountability, and for project monitoring and mapping purposes (e.g., MWater) (Abisa, 2014; Williams *et al.*, 2016; Greggio, 2017). Specifically in PICs, greater digital connectivity has improved rural–urban communication, enhanced livelihood opportunities, and promoted greater citizen engagement in politics and other social spheres, including promoting gender equity (Brimacombe *et al.*, 2018; Titifanue *et al.*, 2018); climate change advocacy (Titifanue *et al.*, 2017); disaster preparedness, response and recovery (Finau *et al.*, 2018); and, during the height of the COVID-19 pandemic in Fiji, enabling bartering to support food security and counter-economic stress (Finau *et al.*, 2018). Nevertheless, exploration of how mobile telephony is enhancing extant social networks and supporting community development aspirations in the PICs context is lacking. Hence, a sub-objective of this study was to explore the social media landscape in Fiji and ask if and/or how improved connectivity may enable rural community development aspirations.

To reiterate, the broad objective of this research was to explore if, how, when, and where social networks have been used to support community development outcomes, with a focus on rural water and sanitation. The results demonstrate that non-WaSH-focused social networks – such as place-based, kinship-orientated urban–rural linkages, select customary norms, relations and practices, common interest associations (such as village development committees), and social media groups – should be considered critical components of the WaSH enabling environment. To make our case, the remainder of this paper is structured as follows. First, we describe the methodology and case-studies on which the data are based. This is followed by the results and discussion section broken into the core themes of Linkages; 'hybrid' village development committees; and mobile telephony and social media. In our conclusion and recommendations section, we argue for a more imaginative and locally attuned conceptualisation of the WaSH enabling environment and suggest that some of the social networks examined herein constitute a fruitful CWM 'plus' avenue in some PIC contexts.

## METHODS

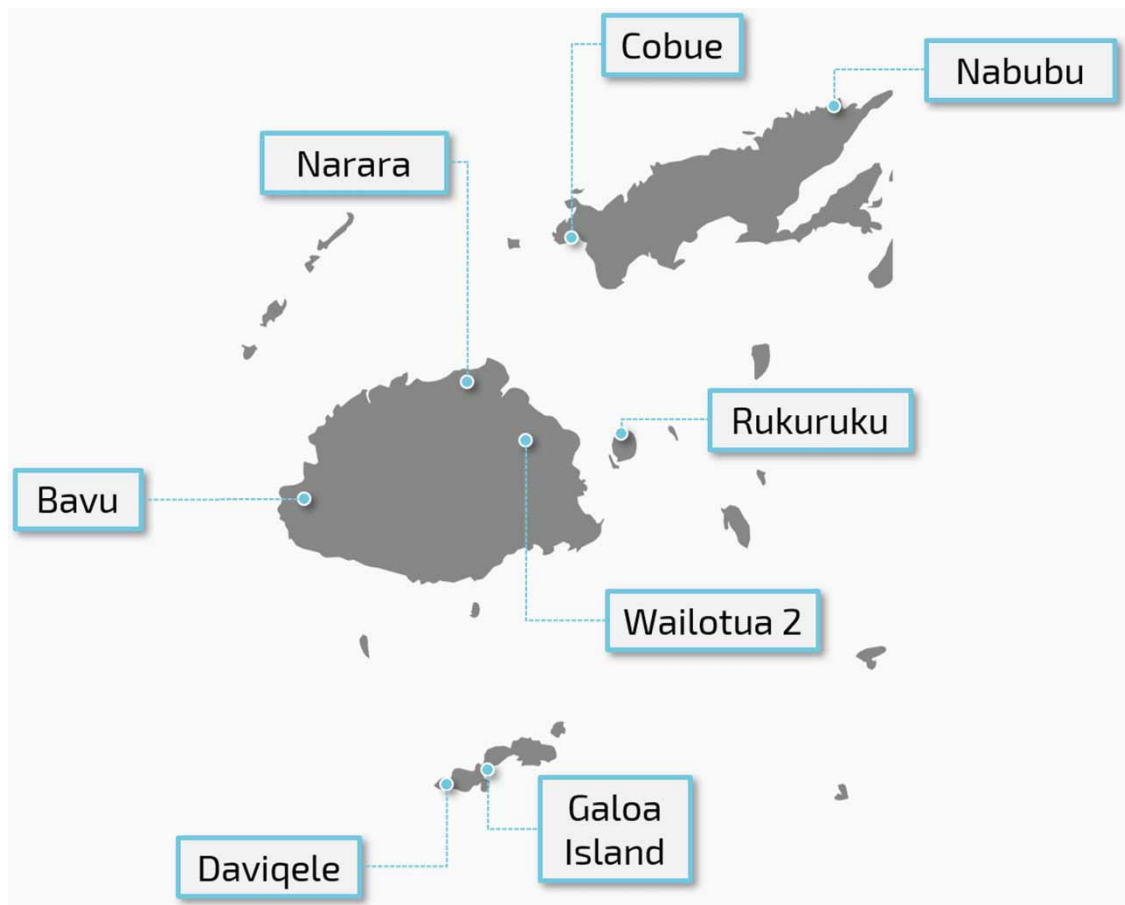
This paper is based on data collected as part of the Pacific Community Water Management Plus (PaCWaM +) project; a multi-year (2018–2022) applied research project supported by the Australian Aid Water for Women Fund, undertaken by researchers from the International Water Centre (IWC), Griffith University, and scholars from The University of the South Pacific.

The bulk of the data drawn on for this paper is qualitative in nature, based on semi-structured interviews conducted in either Fijian or English, which were audio recorded – with consent – translated (from Fijian to English where necessary), transcribed, and coded in NVivo™ for analysis. The first-cycle coding focused on descriptive and thematic analyses, using largely a pre-determined coding framework, while the second cycle of coding was undertaken using a more inductive approach, generating codes from the data (Saldaña, 2013). Interviews

were semi-structured, consisting mainly of open-ended questions. Respondents and interview topics varied widely (see further below).

In the formative research phase (Phase 1), quantitative and qualitative data were gathered in eight rural communities in Fiji (see Figure 1). These case-study sites were identified through desk-top reviews and workshops with WaSH-related government and civil society organisations (CSOs). Communities were selected based on several criteria to ensure a range of representative contexts, including a diversity of geographic, environmental, climatic, and demographic characteristics (e.g., different provinces, coastal and inland locations, high and low rainfall areas, and small and large populations); officially registered villages (*koro*) and settlements; a diversity of past external WaSH-related engagement experiences (e.g., previous CSO and/or government support); a variety of water system types (e.g., gravity-fed from a spring or stream, borehole, rainwater); and communities reported to have relatively ‘good’ community water services and management.

Research teams spent between 5 and 6 days in each community conducting key informant interviews (KII,  $n = 86$ , 53 males, 33 females) and household surveys (HHS,  $n = 174$ ). KII respondents included: water committee

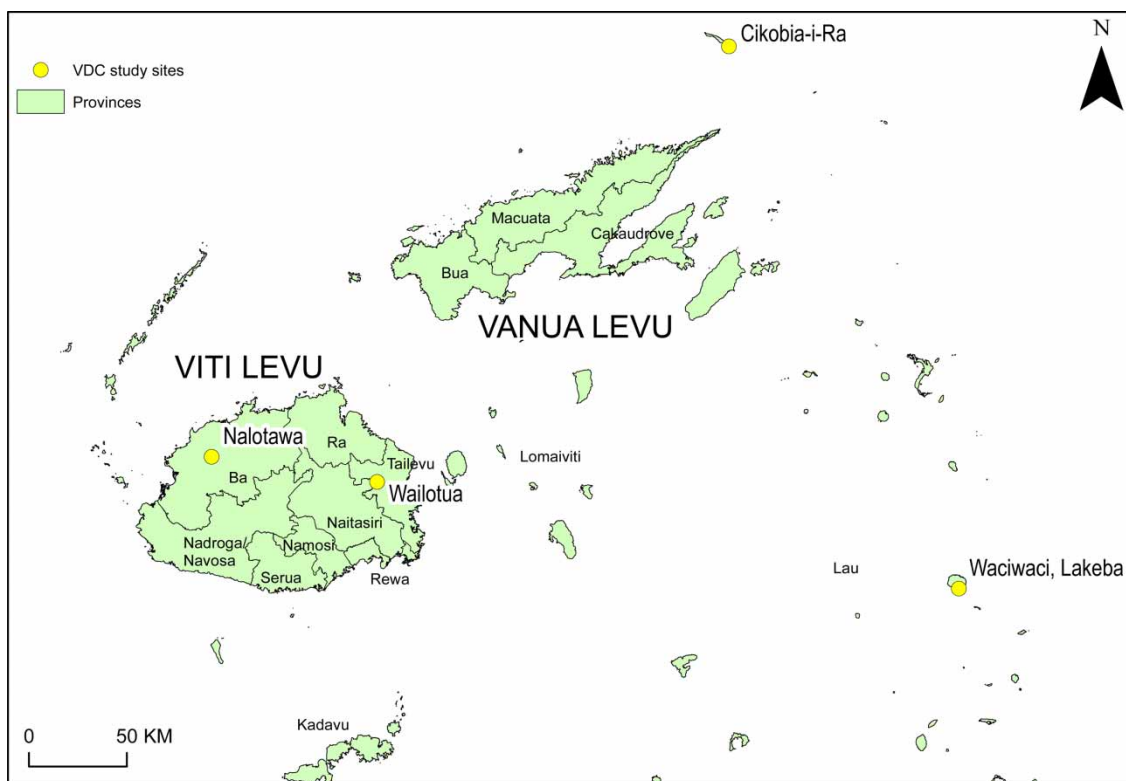


**Fig. 1** | Eight rural communities (case sites) in Fiji. Source: Fiji – R. Sanderson with data from *The Pacific Community (SPC) Statistics for Development Division & Open Street Map (2021)*.

members, community health workers, teachers, community leaders, representatives of community-level women and youth groups, life histories, project actors (people involved in community-level WaSH and non-WaSH projects in the past), and government and non-government WaSH actors. In this paper, we draw on only a small selection of this overall data (discourse focusing on the themes of rural–urban connectivity, projects, and mobile telephony).

The HHS was used to elucidate socio-economic aspects of urban–rural linkages. Data collection was undertaken on tablets linked to the mobile data collection platform SurveyCTO®, then entered into MS Excel™ and summarised using Excel and SPSS™.

In Phase 2, more targeted qualitative research focused on (a) ‘hybrid’ village development committees and (b) social media moderators. The objective was to better understand the rise of ‘hybrid’ village development committees (VDCs) – that is, committees made up of rural, urban, and sometimes overseas-based members rather than just village-based members – and explore if and how they support community development aspirations, including water and sanitation. To explore this, the fourth author of this paper identified four communities – Wailotua Number 1 and Nalotawa (Viti Levu Island), Waciwaci (Lekeba Island) and Vuninuku (Cikobia-i-Ra Island) (see Figure 2) – and then interviewed a rural and urban-based member of each community’s VDC. To explore place-based social media groups, we identified two active Facebook (FB) groups – the Bua Urban Youth Network (BUYM) and the Bula Ko Lau (BLK) – and interviewed one moderator/administrator from each.



**Fig. 2** | Location of case-study villages with ‘hybrid’ VDC villages. Source: Fiji (partial), S. Pene with open-source data from Google maps.

All required ethics documentations were completed and approved prior to data collection. Informed consent was obtained from all respondents before their participation. Supplementary data A provides details on the Phase 1 case-study sites in Fiji, while Supplementary data B provides respondent details for the data used in this paper, including rudimentary community demographics.

### Limitations

A key limitation of this study is its focus on indigenous Fijian communities and the omission of Indo-Fijian settlements. The Phase 1 research included one Indo-Fijian settlement but, due to logistical, budgetary, and capacity reasons, a more demographically balanced sample could not be obtained. Only the domestic remittance household data (urban–rural linkages section) include data from an Indo-Fijian settlement. Further research on Indo-Fijian urban–rural linkages, and Fiji-Hindi social media groups, is warranted.

## RESULT AND DISCUSSION

We commence the results section with a broad survey of urban–rural linkages based on household survey data from our eight Phase 1 villages, followed by a specific case-study that elucidates the utility of not only urban–rural linkages but also micro-proximal linkages and the productive role that (neo)customary practices and norms can play in ensuring the provision of rural community water supply.

### Linkages

#### Quantifying urban–rural connections

Table 1 summarises four proxy indicators that broadly demonstrate the strong socio-economic linkages extant between urban dwellers and their rural kin. Over a third (41%) of surveyed households (HHs) had close family members living outside the village ( $n = 174$  HHs). Nearly half (47%) of all surveyed HHs received remittances (the majority from kin in town), while around a third (35%) sent money to the town. A quarter of surveyed HHs had ‘people in town’ who sometimes ‘pay for other things’ (e.g., school fees, phone credit, transport costs, and provincial levy fees). Not captured here, due to methodological challenges, is the frequency and amount of garden produce and other goods (e.g., animals, mats, baskets) sent from rural areas to urban-based kin.

These numbers capture the essence of the financial support that flows to and from town and village, constituting an important safety net, indicating the strong connection that exists between rural communities and their urban and overseas dwelling kin. Many of these individuals are very much part of the ‘whole community’, continuing to be socio-culturally and economically invested in their ‘home’ village.

The Phase 1 qualitative data suggested that urban–rural linkages were more formalised in Fiji than in our other PaCWaM+ country site (Solomon Islands). There was also more evidence in Fiji of urban residents assisting the wider community – especially in regard to WaSH matters – than in the Solomon Islands, where although there

**Table 1** | Select socio-economic data on urban–rural linkages ( $n = 174$  households).

Fiji	Indicator
41%	% of rural HHs who have close family members in town/urban centre
47%	% of rural HHs who receive remittances
35%	% of rural HHs who send money to the town
25%	% of rural HHs where ‘people pay for other things’

Source: primary survey (2021).

were some examples of urban-kin financially assisting with collective projects (e.g., building community halls and schools), there was little in regard to WaSH (Love *et al.*, 2020). In Fiji, support by urban residents was frequently conducted through fundraising activities, such as ‘bring and buy’ (cooking and selling food) or direct cash donations, collectively referred to as ‘*solu*’.

There were numerous examples of urban and/or international diaspora assisting with rural village WaSH-related developments in Fiji. Examples include paying for community rainwater tanks and writing funding proposals (e.g., Nabubu and Rukuruku). An especially illustrative example of how leveraging social networks can support community WaSH outcomes is found in the history of the village water supply system in Galoa.

### Networks and culture as WaSH enablers: the case of Galoa

Galoa is a *koro* of 50 households located on Galoa Island in southern Fiji (Figure 1). A small, predominantly sand-based island, Galoa has limited freshwater sources. In the pre-colonial period, people collected freshwater from shore-line springs. In the 1930s, a series of communal cement rainwater tanks were constructed. Later, a key shoreline spring near the village was improved (cemented) and used, primarily, for non-drinking purposes. Even as more families purchased household rainwater tanks, people still struggled to access sufficient, reliable, and safe drinking water. The community ultimately found a solution to their water issues by leveraging extant social networks and drawing on customary norms and practices.

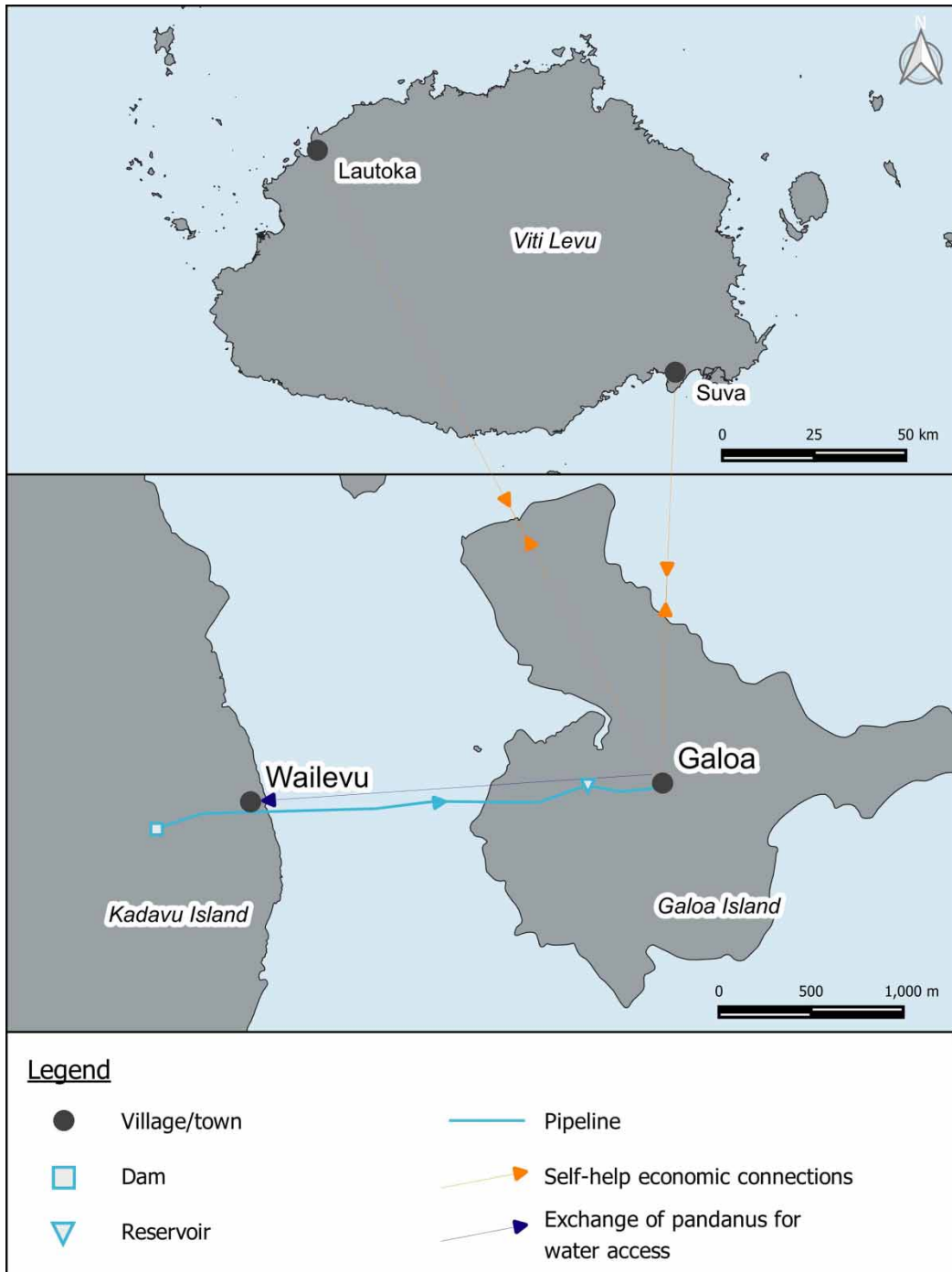
The *mataqali* [clans/land owning units] in Galoa have strong socio-historical linkages with Wailevu, a small *koro* located on adjacent Kadavu Island, which is a much larger, volcanic island with plentiful freshwater sources. Galoa and Wailevu are both parts of the *tikina* [district] of Nabukelevu and have strong traditional links with one another. Although many Galoa *mataqali* have customary rights-in land on Kadavu, they do not have unhindered access to a reliable freshwater source. In the early 2000s, some customary elders from Galoa – representatives from each *mataqali* – visited the *mataqali* leaders of Wailevu to request access to one of their hinterland water sources (see Figure 3).

Permission was given, and once all the materials were delivered, a dam was constructed in just 2 weeks, the water pipes were laid and connected to the village not long after. After the project, a ceremony was undertaken with Galoa families gifting the Wailevu community kava [*yaqona*], whales’ teeth [*tabua*], bags of sugar, flour, and rice, and a sum of money which was used to open a village investment account in the Unit Trust of Fiji. An official agreement was also signed between *mataqali* village leaders in each village. Additionally, to this day, women in Galoa annually harvest, dry, and ‘gift’ a large amount of dried pandanus leaves (*Pandanus whitmeeanus*) to the women of Wailevu for weaving mats. This was instigated ‘... to keep [strong] ties [and] bless the people of Wailevu with pandanus, which is a bit hard to find in Wailevu village’. *Yaqona* and *tabua* are highly valued gifts in ceremonial contexts (Brison, 2007), while mats express ‘relational pathways between kin groups and mediate between the material and the spiritual’ (Hulkenberg *et al.*, 2021). The use of both customary and contemporary norms and processes to address contemporary water access challenges is a constructive, creative, and agentic adaptation.

In addition to leveraging micro-proximal social networks (with Wailevu), Galoa residents also harnessed the support of community members no longer resident in the village. The community raised the money needed for their compulsory community contribution towards the cost of the water system through a combination of mat sales and fundraising efforts led by women.<sup>1</sup> In October 1998, some Galoa women began selling mats in Kadavu and a few women travelled to Suva to sell mats during the Fiji Day national holiday celebrations. They also conducted *solu* with Galoa emigrants in town. The women were initially focused on raising funds

<sup>1</sup> Until it was waived in 2015, in Fiji, communities were required to pay 10% of the total construction costs of a water system to the government.





**Fig. 3** | Galoa and Wailevu villages, with the location of Galoa water supply source and economic connections (orange arrows), leveraged to support water system installation. *Source: Map by R. Sanderson with data from The Pacific Community (SPC) Statistics for Development Division & Open Street Map.* Please refer to the online version of this paper to see this figure in colour: <http://dx.doi.org/10.2166/wp.2022.202>.

for a community hall. Over the next 2 years, the women continued selling mats and conducting *solu* in Suva. In 2001, members of the Galoa women's committee in Suva decided to move the mat sales and *solu* activities to Lautoka (the second largest city in Fiji, see [Figure 3](#)). In the fourth year, men from Galoa joined the women in Suva, and it was decided that they now had enough money to construct not only a community hall but also meet the community contribution cost for the water supply. Collectively, around FJD\$30,000 [AUD\$20,000] was raised over 5 years. The water supply system became operational in 2004 and is still running to this day.

### 'Hybrid' village development committees

In Fiji, community governance is highly structured and relatively uniform. A community is classified as either a *koro* (a registered indigenous 'village') or a 'settlement', which is a non-registered community consisting of either indigenous Fijians (officially called 'iTaukei') or Indo-Fijians (officially called 'Fijians of Indian descent'). In indigenous Fijian or iTaukei villages, a community is governed through reference to customary leadership positions, headed by the *Turaga ni Koro* (TnK) who is chosen by the villagers and paid a small stipend by the government. A Village Council [*Bose va Koro*] presides over various village committees. [The Ministry of iTaukei Affairs draft Village Bylaws \(2016\)](#) suggests that every *koro* should have 11 standard committees, including a water committee, health committee, development committee, natural resource management committee, school committee, and more. These committees form part of the quorum for discussions at Village Council meetings, where decisions made are recognised by the state as law. Village development committees are one of the most important of these various committees.

In 2021, we identified and interviewed members of four 'hybrid' village development committees that consisted of both rural village-based members and extra-local members, meaning people from the village but who now reside elsewhere (in urban centres within Fiji or overseas). Details of the four VDCs, including an overview of their village WaSH situation, membership attributes, and respondent details, are listed in [Table 2](#).

### 'Hybrid' VDCs: an adaptive response to socio-economic change

The make-up of the four VDCs varied, with the size of the committees ranging from 4 (Waciwaci) to 21 (Vuninuku). All our hybrid VDC examples included urban- and village-based members except Waciwaci, where two members were residents in Suva and two were based overseas. This 'hybrid' membership model reflects the large levels of out-migration extant through the country. As noted in [Table 2](#) (context), this is especially pronounced in Waciwaci, Vuninuku, and Nalotawa, and it was also evident in many of our Phase 1 villages.

The VDCs also varied in how they operated. The previous Vuninuku VDC met monthly, as did the Nalotawa VDC who often met after the monthly *Bose Va Koro* meetings, as well as when a significant number of urban dwellers returned to the village. Interestingly, the Nalotawa VDC sometimes met outside the village, in Nadi or Lautoka, where many people now live. For Wailotua No. 1, it was noted that since the onset of community transmission of COVID-19, the VDC had not met, but the previous year they met three times, with the urban-based members travelling to Wailotua to meet at the village hall.

The high levels of out-migration evident in these communities raise challenges for rural development planning, policy, and implementation, as well as village-level governance and self-reliance. In Nalotawa, there were only three young men permanently resident in the village in 2021, while in Waciwaci the decline of young people meant that '*we just don't have the manpower to carry out the [necessary] physical activities in the village*' (Waciwaci-VB-M). The flip-side of this is that many emigrants regularly return during holidays, special events, or after

**Table 2** | Village development committee details.

Village/VDC	Demographics	Context	WaSH situation	VDC details
Vuninuku (Macuatu Province, Cikobia-i-Ra)	10 (4 permanently occupied HHs)	Many people have migrated to Labasa (Vanua Levu) to farm <i>yaqona</i> , returning during holidays and special occasions.	<ul style="list-style-type: none"> <li>• Gravity-fed water source from a protected spring</li> <li>• Numerous hand-dug ponds</li> <li>• 20 rainwater tanks</li> <li>• Every house has at least one tap piped to the house</li> <li>• Every house has a toilet (pour flush or flush toilet with septic)</li> </ul>	<ul style="list-style-type: none"> <li>• Island-wide VDC</li> <li>• Previous committee had 21 members (representing all four villages on the island)</li> </ul> <p><b>VDC respondent details</b>  <i>Urban:</i> Suva-based retired civil servant. Male, 66 yo.  <i>Village:</i> VDC Chairman. Male, 59 yo.</p>
Nalotawa (Ba Province, Viti Levu)	30–50 (21 HHs (9 permanently occupied HHs))	Many people have migrated to Nadi and Suva to find full-time work, while other families lease their land to Indo-Fijian sugarcane farmers. Many emigrants return during the holidays.	<ul style="list-style-type: none"> <li>• Gravity-fed water source from a protected dam</li> <li>• Three rainwater tanks</li> <li>• Every house has at least one tap piped to the house</li> <li>• Every house has a toilet (pour flush or flush toilet with septic)</li> </ul>	<ul style="list-style-type: none"> <li>• VDC is currently being re-established</li> <li>• Urban emigrants have an interim, unofficial VDC-type group</li> </ul> <p><b>VDC respondent details</b>  <i>Urban:</i> Suva-based, full-time professional. Male, 47 yo.  <i>Village:</i> TnK. male, 57 yo.</p>
Waciwaci (Lau Province, Lakeba)	80 (35 HHs (many vacant HHs))	Many people have migrated to Viti Levu due to limited economic opportunities. People only return on special occasions due to transport challenges and high costs.	<ul style="list-style-type: none"> <li>• Gravity-fed water source from a protected spring</li> <li>• Nine rainwater tanks</li> <li>• Every house has at least one tap piped to the house</li> <li>• Every house has a toilet (pour flush or flush toilet with septic)</li> </ul>	<ul style="list-style-type: none"> <li>• Four members of VDC</li> <li>• Two Suva-based and two overseas -based</li> </ul> <p><b>VDC respondent details</b>  <i>Urban:</i> Suva-based, self-employed. Female, ~50 yo.  <i>Village:</i> TnK. Male, 60 yo.</p>
Wailotua No. 1 (Talilevu Province, Viti Levu)	197 (30 HHs)	Located in one of the most populated provinces, just 42 km from Suva. The village is made up of three settlements. The main income is derived from <i>yaqona</i> farming.	<ul style="list-style-type: none"> <li>• Gravity-fed water source from a protected spring</li> <li>• Three rainwater tanks</li> <li>• Every house has at least one tap piped to the house</li> <li>• Every house has a toilet (pour flush or flush toilet with septic)</li> </ul>	<ul style="list-style-type: none"> <li>• Eight members of VDC</li> <li>• Six Suva-based and two village-based</li> </ul> <p><b>VDC respondent details</b>  <i>Urban:</i> Member of the finance section of VDC. Suva-based, naval engineer. Male, 60 yo.  <i>Village:</i> TnK. Male, 60 yo</p>

Source: Primary data (2021).

retirement. This can place considerable stress on rural WaSH services and infrastructure, with the influx of large numbers of people during holiday periods posing a particular challenge.

In this light, the ‘hybrid’ committee membership structure is an innovative adaptation. In Nalotawa, the community now uses an urban–rural membership structure for all their standard village-based committees – water committee, health committee, and natural resource committee. This signals a significant shift in how communities are structured and managed, underscoring the fact that the ‘whole community’ is not simply those who currently or permanently reside in a village (Aalbersberg *et al.*, 1997).

When asked ‘Should government and NGOs involve urban-based village residents in development-related consultations?’ All VDC respondents replied in the affirmative.

*‘I think that if any development is to be done in the village, the project must consult our relatives in the urban areas (Nalotawa-VB-M6)*

*I think that it is important for the Government and NGOs [non-government organisations] to consult both sides, those of us in the village and those in the urban areas [...] so that there is sharing and learning at the same time (Cikobia-VB-M2)’.*

Although four VDCs are a small sample size, it would appear that the government is only reactively engaging with VDC members in town and NGOs are not engaging with the ‘whole community’ at all.

### **VDC objectives, functions, and activities**

VDC respondents in both urban and rural locales were questioned about the type, content, and value of urban–local linkages. Maintaining a connection to culture and land (*vanua*), supporting villager’s education, providing guidance and support for village development activities (e.g., participating in *solu* and writing funding proposals), and building financial capacity were the most prominent themes elicited. For example, ‘*What connects us together in the urban areas and those back in the island is our connection to the land [vanua]*’ (Cikobia-UB-M1). The urban respondent from Wailotua stated:

*‘For us in the urban areas we work very closely with the VDC because we have the finance and the capacity to assist in the development of the village. At times, the village request development support or traditional obligations so always a request is there, so we ensure to have enough so that we can support in cash or in other forms of assistance (Wailotua-UB-M5)’.*

The explicit objectives of the VDCs were, primarily, to improve the standard of infrastructure and the quality of life for people in each community.

*‘The focus of our VDC was to connect urban services back to the village so that villagers can also share what urban communities are enjoying as well. It is important to assist in the development of basic needs of communities such as electricity, housing development and especially water services, which is a major challenge in the island (Cikobia-UB-M1)’.*

The specific activities of VDCs depend on the development priorities identified through village processes (e.g., *Bose Va Koro* meetings). In the four case-studies, the key development activities led by the VDCs included:

- *Vuninuku*: Installing a reservoir tank, household water tanks, solar panels, the construction of a village hall, and early childhood centre;
- *Nalotawa*: Upgrading the reservoir tank, supplying solar panels, leasing more land for *yaqona* farming;
- *Waciwaci*: Construction of reservoir tank and the provision of private taps for each household in the village; and
- *Wailotua No. 1*: Water system upgrade/Unit Trust of Fiji and community hall upgrade and extension (evacuation shelter for floods and cyclones).

Note that in the case of Wailotua, the community raised enough money to support the 10% community contribution towards water system rehabilitation, but this was waived just before implementation, so the VDC instead invested the money in the Unit Trust of Fiji.

Post-disaster relief was also a key VDC objective, especially noted in Wailotua:

*'... our VDC members in the urban areas always mobilize our relatives in the urban areas to be the first to respond to the village after a disaster. Normally they come in their private cars and chartered bus with food packs and household items (Wailotua-VB-M4).'*

The monies to support all these development activities were primarily derived from *solu*.

### **Solu for WaSH**

The VDCs overall role is to prioritise, plan, fund, and progress community development aspirations, with the bulk of funding coming from fundraising or *solu*. In Cikobia-i-Ra, the VDC worked towards having an annual operating budget to cover the expenses of the Church, community projects, and other initiatives such as water and sanitation improvements. This operating budget is all raised through fundraising or 'love gifts' as the chairman referred to *solu*.

The *solu* activities for Nalotawa were generally organised around 'Nalotawa Day'.

*'... everyone in the urban areas visit the village and it is a celebration time where we fundraise for village developments ... each family are required to give FJD\$100.00 each, or each young man in the village FJD\$50.00. The money raised is used for village expenses/obligations to the church, to the village, and to the provincial office. The other portion of the money raised is normally deposited to the Unit Trust of Fiji (Nalotawa-VB-M6).'*

The Nalotawa Day fundraising drives involve not only village residents and those based in town but also diaspora overseas and are generally organised along *mataqali* lines. At the last Nalotawa Day, some of the money raised was used for upgrading the village reservoir tank and constructing a fence to protect it from animals and other potential contaminants. Similarly, the Waciwaci VDC allocates their *solu* efforts into every quarter, leading up to 'Waciwaci Day' which is held in October each year.

*'The reason why we raise funds is to support village development issues, such as having funds for the operation and the maintenance of the village generator. We have allocations to the water committee, the village nurse [for transportation of sick people to hospital] ... catering for guests [particularly government officials] and cleaning-up the village. We have allocated all our major development projects to the VDC in the urban areas and those overseas to plan and finance its implementation (Waciwaci-VB-M7).'*

Urban members are critical to these *solu* efforts. Some urban-based VDC members are very proactive and prepared, meeting regularly to ensure that they can respond when required:

*'... for us who are from the village that are based in Suva, we normally meet after every two weeks to discuss our activities, plans, projects and so forth. We have our own small fundraising to raise funds so that when the village calls, we have enough finance to support what the village is requesting from us (Wailotua-UB-M5).'*

The urban-based member of the VDC for Nalotawa noted that there is both a Suva-based network and a 'western urban-based' network in Viti Levu:

*'For us, in Suva, we normally have small scale fundraising in the form of soli where families give an allocated amount to our urban based network. The funds are to prepare ourselves [in advance] to finance and support any traditional/cultural or social obligations from the village (Nalatowo-UB-F1)'.*

A key enabler of *soli* today is mobile telephony. In Fiji, Vodafone's M-PAISA app facilitates cash transfers without the need for a bank account. The quantity of M-PAISA transactions increased considerably during the COVID-19 pandemic and, by December 2021, was totalling a value of \$250 million per month (Krishant, 2021). A significant proportion of these transactions are remittances from overseas; in July 2021, these amounted to \$15.35 million for that month alone (Vula, 2021).

### **Virtual networks: mobile telephony and social media**

In addition to VDCs, there are other place-based common interest associations in urban centres. For example, in addition to the Galoa women's group on Viti Levu, there is a Suva-based group made up (primarily) of tertiary students. There are other informal Suva-based groupings, many focused at the *mataqali* level, and then there is the plethora of virtual place-based common interest groups such as the very active Bula Ko Lau Facebook group (which serves Waciwaci and many other villages located across the Lau group of islands).

Mobile connectivity, internet access, and social media use – specifically Facebook usage – are very high in Fiji and continue to grow; there are more mobile connections in Fiji than people and 649,100 people reportedly use social media (71.6% penetration) (Kemp, 2022). Internet use expanded by 7.3% between January 2021 and January 2022, while social media usage grew by 6.4% (Kemp, 2022). Other popular social media platforms used in Fiji are TikTok, Instagram, and YouTube, as well as messaging apps such as Viber and Messenger.

The point of exploring social media in Fiji was to better understand what people themselves were doing with ICTs in regard to locally-led development. A guiding question was: Is there a role for government agencies and donors in the social media space to assist in further supporting rural WaSH development? As a first step into answering these questions, we conducted interviews with moderators from two of the most active place-based Facebook (FB) groups in the country: the Bua Urban Youth Network (BUYN) and the Bula Ko Lau (BKL) FB group.

The BUYN was established in 2007 and has around 3,700 followers. Bua is one of the 14 provinces of Fiji, located in the west of the island of Vanua Levu. Membership is multi-ethnic, including not only iTaukei Fijians but also Fijians of Indian descent. The BKL FB group began in 2020 and the name translates as 'to uplift, rise, bring life to the Lau Province'. The BKL FB group has an older demographic (30–60 yo), possibly due to the fact that 'we speak in the Lauan dialect in the BKL Facebook page and not in English; this may be the reason why our younger generations are not as interested to join discussions' (BKL-M). The content of both FB groups varies, but posts focused on rural well-being and development-related issues are common. Two examples are briefly explored below – disaster preparedness and response and COVID-19 public health awareness.

### **Disaster preparedness and response**

Following the January 2022 Tongan underwater volcanic eruption, the Lau islands group was impacted by a tsunami and ashfall that damaged schools, village infrastructure (including water supplies), and fishing boats. The Bula Ko Lau virtual network quickly jumped into action, assisting the Lau Provincial Council to raise funds for purchasing cartons of drinking water to send to 52 schools (Figure 4).

The moderator from the BUYN also provided examples of how the network has been used in disaster preparedness and response. Before, during, and after Tropical Cyclone Yasa – a powerful Category 5 cyclone that devastated much of Fiji in December 2020 – people used the BUYN FB group to keep each other up-to-date with warnings, impacts, and assist with assessment and post-disaster support. Finau *et al.* (2018) documented

**Lau Fundraiser**



Bula ko Lau is on the move once again, raising funds to ship drinking water to the 52 schools – pre-school, primary & secondary in Fiji's eastern maritime province of Lau – as their drinking water was affected by the ash fallout from the Tonga Volcano.

With our senior students sitting their exams this fortnight, and their younger siblings preparing to head back to classes, safe and clean drinking water will be waiting for them, if you give generously.

**Send your donations to:**

**Mr Samuela Savu in Suva, Fiji on:**

**Mpaise (Vodafone) +679 8307669**  
or **MyCash (Digicel) +679 7356689**

**Donations\*** can also be sent to the same recipient via Western Union.

*\* all donations will be acknowledged and audited.*

**#deiyatuLau #malololomaLau #mebulakoLau**

**Fig. 4** | Bula Ko Lau Facebook post – Lau fundraiser for drinking water. *Source: Facebook.*

the same trend in 2016 with Tropical Cyclone Winston, noting how social media groups were critical in facilitating emergency warnings, supporting preparedness, bolstering a sense of solidarity, and even sharing their experiences live. The BUYN moderator suggested that social media helped to enable a new level of scrutiny and accountability for government and NGO emergency response efforts:

*'We also provided some accountability ... [and] were able to communicate directly with Government and NGOs. For instance, we contacted the Fiji Council of Social Services when they missed out on a particular community (BUYN-F).'*

This ability to push accountability from below speaks to the ability of e-communication to assist people in advocating for, and sometimes driving, change (Brimacombe *et al.*, 2018). In contexts such as Fiji, where the government is relatively active in the WaSH space, there is arguably the potential for such citizen-led scrutiny to be fostered and directed towards rural WaSH concerns.

### COVID-19 public health awareness

The BUYN FB group was especially proactive in countering misinformation during the height of the COVID-19 pandemic in Fiji. As elsewhere in the world, false narratives about the epidemiology of COVID-19 and side-effects of vaccination were high in Fiji, with FB used to spread numerous falsehoods, such as 5G conspiracy theories (even though there is no 5G in Fiji), and promoting vaccine hesitancy (Lokshin *et al.*, 2021). The BUYN Facebook administration team was active in trying to counter this misinformation:

*‘One of the best ways we found to be effective during our COVID response was getting medical experts who were from my province Bua; those that speak the dialect and know the area well, to brief the viewers on the COVID updates ... [this had] ... the highest views ... We also targeted our audiences, those that were in need of legitimate and verified information (BUYN-F)’.*

BUYN organised a series of live COVID-19 information sessions on topics including COVID updates, vaccination, travel restrictions, social distancing, and other Government and the Ministry of Health restrictions. The information sessions were flagged as *talanoa* sessions (Figure 5).

*Talanoa* is a Fijian word that reflects a process of inclusive, participatory, and transparent dialogue. The process of *talanoa* involves the sharing of ideas, skills, and experiences through storytelling. Providing a conversational platform for sharing information and asking questions, using local experts speaking in the local dialect, was powerful and effective in countering the ‘infobesity’ of misinformation circulating in the Pacific and demonstrates that social media can be a powerful community development tool. But what about WaSH specifically?

Explicit WaSH-related content, other than the BLK Tongan volcano relief example, was not in evidence. However, the administrator for BKL noted that his family’s FB account often carried WaSH-related posts as they live in one of two villages that supply water to the government station and many other villages. Moreover, both interviewees were supportive of the idea of using FB to engage with WaSH-related issues, including in the context of community water management. The BUYN moderator noted:

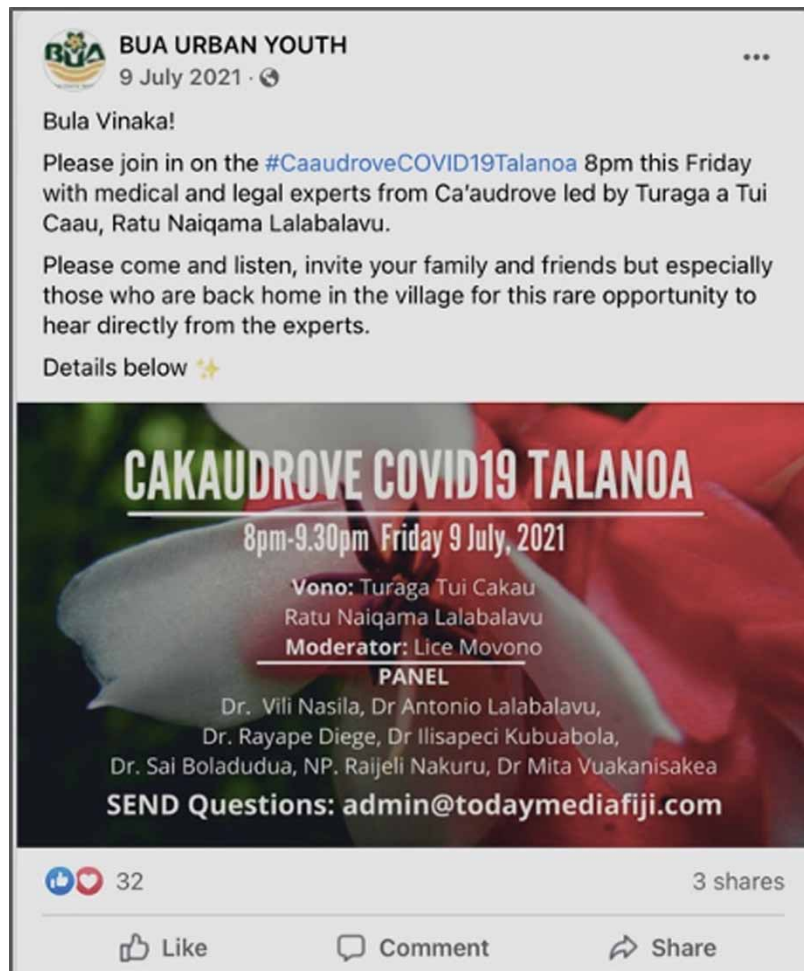
*‘... social media is a pivotal tool in advocacy work [...] we are always looking at ways we can further enhance our focus and delivery [...]. I would suggest that an effective way to engage in water management issues using social media is to use Facebook Live where sessions are interactive and audiences can directly raise their concerns (BUYN-F)’.*

Both moderators further stressed that any WaSH-related social media content would be most effective if it was delivered by local experts in local dialects, used local graphics and video images, and noted that it did not need to be professionally produced – ‘funny and adventurous’ is more likely to be impactful than slick and produced.

### Transferability beyond PICs

Notwithstanding the importance of place-based social networks and acknowledging that each community will have its own set of WASH challenges, the broad tenets of leveraging social networks for improving rural water and sanitation services remain relevant globally. For example, in Australia, remote and isolated Indigenous communities rely on word of mouth and a vast network of tribal and kinship links to communicate and support





**Fig. 5** | Bua Urban Youth Network Facebook post – COVID-19 *talanoa*. Source: Facebook.

extended families across the country (Waterworth *et al.*, 2015). Applying some findings reported here, in particular the widespread use of social media, to such communities elsewhere may further enhance community connections and assist in leveraging the social capital needed to strengthen health and well-being outcomes in off-grid, decentralised locales (e.g., Rice *et al.*, 2016).

## CONCLUSION

In the Pacific Islands, the ability of governments and CSOs to offer ‘services’ to rural populations – including ongoing support to community water managers – is limited. In practice, it is non-state institutions and actors, such as church, chiefs, and village organisations and committees that ultimately provide many of the ‘services’ typically associated with the state. This is supported by a suite of cultural norms. Part of the rationale of this study was to investigate what kinds of informal local support systems exist, assess if they engage with WaSH concerns, and explore what this might tell us about alternative ‘plus’ options in the PIC context. We identified

numerous self-help initiatives that have leveraged extant social networks to positively inform rural WaSH outcomes. These networks were primarily used to fund new, or rehabilitate old, systems – not provide follow-up management support. Nevertheless, we know that in addition to providing direct economic support, these same networks are also knowledge and capacity-building networks (e.g., assisting with funding proposals). Regardless, our data clearly show that social networks built on kinship and place, supported by norms of obligation and reciprocity, constitute a central part of the WaSH enabling environment in the Fiji context.

First, we drew on household survey data from eight rural communities to demonstrate the strong socio-economic linkages that exist between urban and rural family groups. The qualitative data from these same communities showed that these networks provide not just family support but also community-wide support; infrastructure improvements that stand for the ‘social whole’, like water systems, community halls, and schools. This was especially evident in Nabubu, Rukuruku, and Galoa. The Galoa case-study underscores the important point that leveraging micro-proximal rural-to-rural relations, not just urban-to-rural networks, can also be critical. The activation of (neo)customary practices (and values) to further build cooperation and trust between Galoa and Wailevu highlights the productive side of ‘bonding social capital’. When people and culture – rather than a government or its agents – enable agreement making between similar but differentially situated groups to ensure equitable access to safe, reliable, and adequate water, they must be appreciated as critical components of the local WaSH enabling environment.

Second, we examined four ‘hybrid’ VDCs made up of both rural and extra-local (urban or international) members. This ‘hybrid’ membership structure is an innovative adaptation that has been beneficial for communities, an innovative response to high levels of out-migration. Functionally, urban-based members have provided critical human and fiscal resources that have enhanced rural WaSH outcomes. Moreover, some VDCs operate as an important post-disaster buffer, providing a source of adaptive capacity in response to emergencies. In the case of this very small sample, the government had only rarely (and reactively) engaged with VDC members in town and none had ever had any engagement with non-government organisations. If this was to be replicated across a larger study size, development actors can be said to be missing an important and influential human resource: village sons, daughters, and place-based common interest associations based in town who are already active in, and focused on, rural community development.

Lastly, we saw that social media is widely used in Fiji to support urban–rural linkages. While we found little evidence of WaSH matters being explicitly engaged with the two social media groups investigated (other than the provision of drinking water as a post-disaster response), mobile telephony and social media are critical to supporting *solu* and are used to further select community development issues (e.g., disaster preparedness and response, countering COVID-19 misinformation). Indeed, the proactive use of FB ‘live’ information discussions (*talanoa*) to counter false narratives about COVID-19 reiterates how powerful social media can be as a community development and advocacy tool.

So, what are the WaSH policy implications of these findings? Might these individuals and networks serve as constructive WaSH allies? Possibly. Given the study’s small sample size, further research – accompanied by monitored pilot activities – is required before determining whether such networks offer an alternative, responsible, and effective avenue for supporting rural WaSH improvements or not. While not a proxy for professionalised external support, engaging with the ‘whole community’ – especially given their influence and the fact that they are already engaged in the development space – would seem a logical step. Given the unique character and significant WaSH challenges extant in the PICs, exploring novel development approaches is warranted. While not eliding the challenges that do exist in Fijian socio-cultural systems (such as gendered and intergenerational asymmetry), we argue that in contexts such as Fiji – where rural WaSH considerations are on people’s radar and a functional degree of trust and accountability permeates social relations and urban–rural linkages – working

with the grain by acknowledging and engaging with social networks simply makes sense. Furthermore, beyond the Pacific Island context, the insights gained from this study can be applied in other similar contexts around the world where communities are situated remotely from centralised WASH services.

## DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

## CONFLICT OF INTEREST

The authors declare there is no conflict.

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