

RECHARGE

Resilience in a Changing Climate: Advancing Research on Groundwater for Equity

VANUATU

Groundwater Country Profile

February 2025

77% of Vanuatu's population **resides in rural areas**.

21% of rural households use **groundwater** via wells or piped schemes as their **drinking water source**.

7% of rural households have access to **safely managed drinking water services**.

Rural water service coverage

In rural Vanuatu, rainwater point sources are the primary drinking water source, followed by piped water. Piped water sources include both groundwater and surface water.



of rural households use **groundwater** for washing.

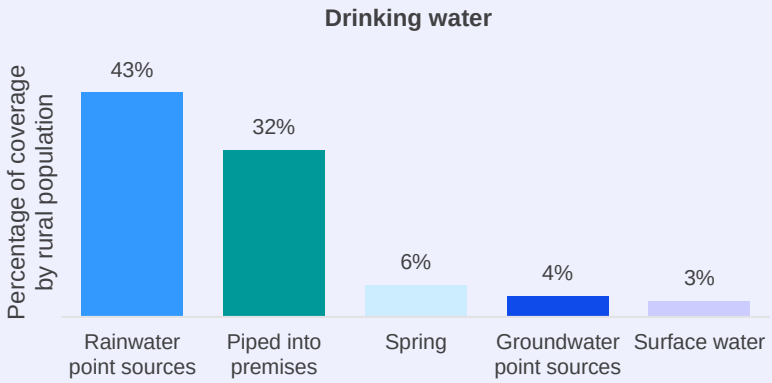
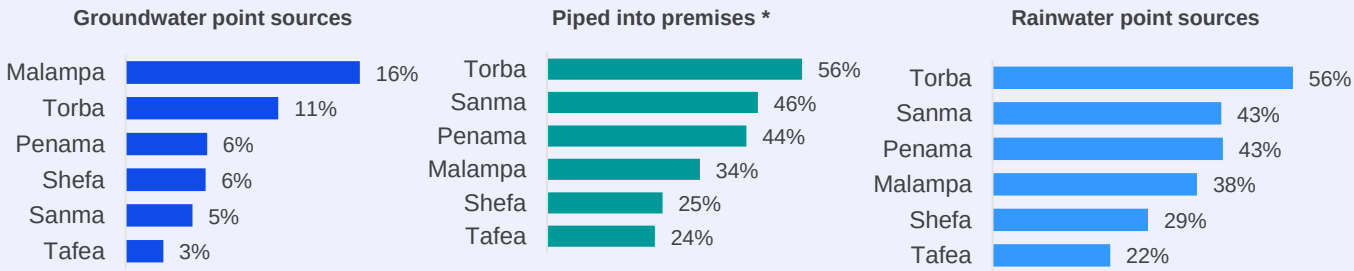


Fig. 1 – Percentage of rural household coverage for primary drinking water sources (Vanuatu MICS, 2023).

Water sources by provinces

Geographical differences in the distribution of water sources are apparent across provinces.



* *Piped into premises include both groundwater and surface water sources.*

Fig. 2 – Distribution of water sources by provinces (Vanuatu MICS, 2023).

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Accessibility by wealth quintiles

Middle-income households use groundwater point sources more often than higher- and lower-income households.

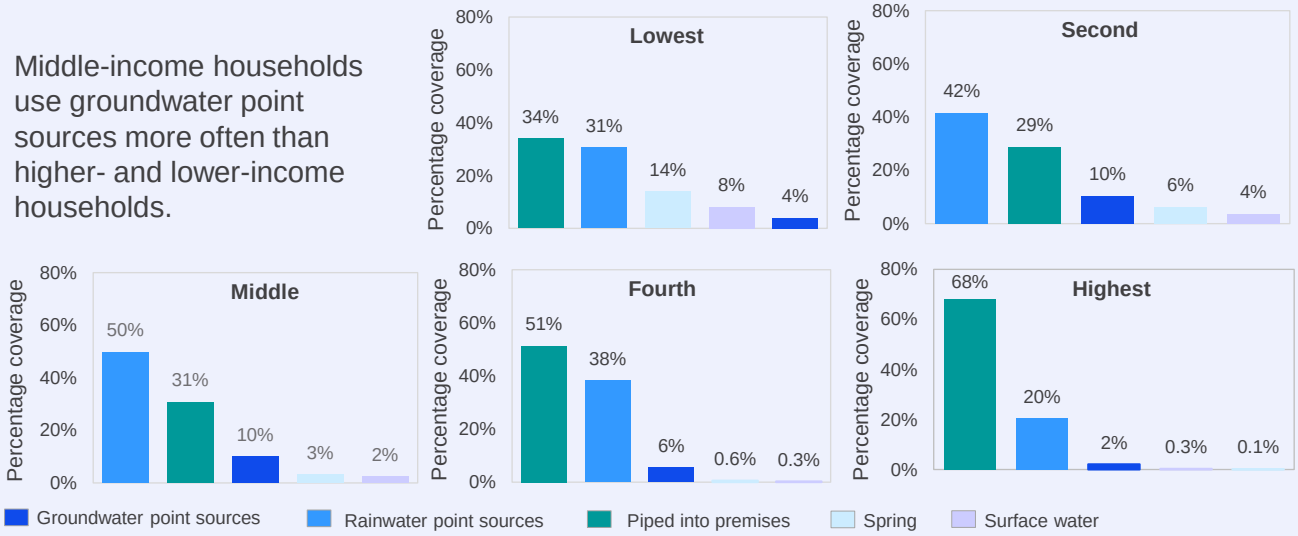
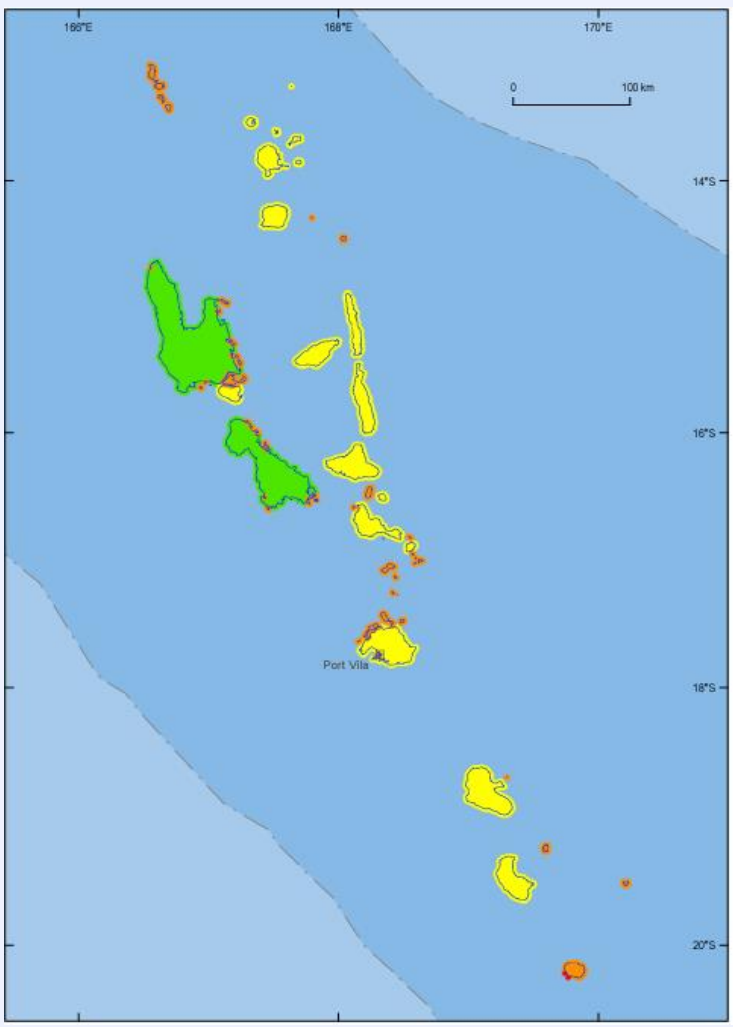


Fig. 3 – Use of drinking water sources in rural areas by wealth quintiles (Vanuatu MICS, 2023).



Groundwater vulnerability to climate change

- Groundwater can be a reliable source that can provide substantial water supplies, even during periods of **severe drought** (FAO, 2016).
- Overall, future changes in rainfall have been estimated to have a **low to moderate impact on groundwater** sources in Vanuatu, although groundwater on smaller islands is at higher risk.

Higher

Higher potential impact (rapid recharge response and <1500 mm rainfall, Lower system adaptability

Moderate High

Moderate high potential impact (rapid recharge response and <1500 mm rainfall, Lower system adaptability

Moderate

Moderate low potential impact (rapid recharge response and >1500 mm rainfall, Lower system adaptability; or Moderate potential impact (intermediate recharge response and <1500 mm rainfall, Moderate system adaptability

Moderate low

Moderate low potential impact (intermediate recharge response and >1500 mm rainfall, Moderate system adaptability

Fig. 4 – Groundwater vulnerability with future changes in rainfall in Vanuatu: 2035-2064 (Dixon-Jain et al, 2014).

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Water availability when needed

Groundwater is the most reliable source of water in rural areas.

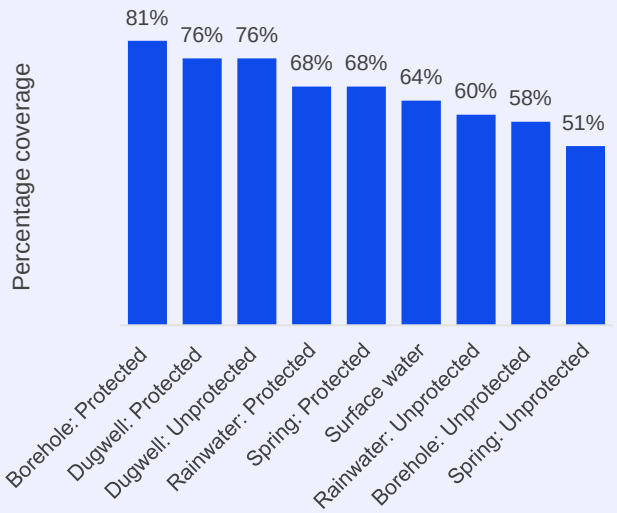


Fig. 5 – Percentage of rural households with water always available in the last month – by source (Vanuatu MICS, 2023).

Water quality

Water quality is a concern across various sources, with **over three-quarters** of sampled piped, groundwater and rainwater sources found to be heavily contaminated with *E. coli*.

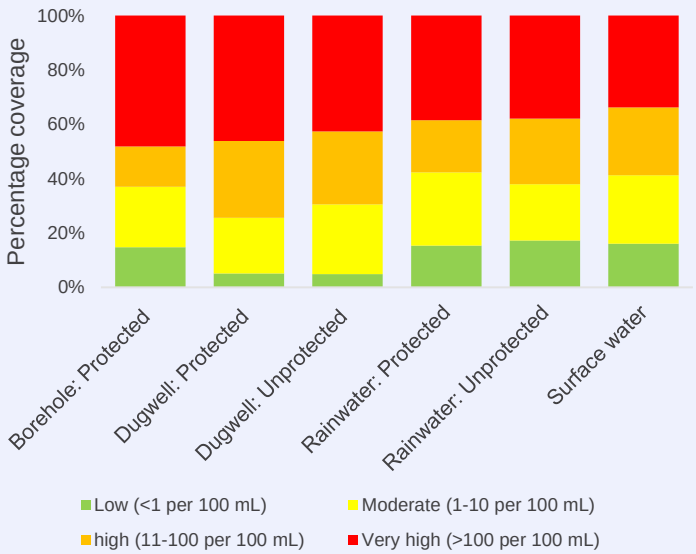


Fig. 6 – *E. coli* concentration in rural water sources (Vanuatu MICS, 2023).

Key availability indicators

- **Piped groundwater sources perform relatively well**, offering more reliable year-round and 24-hour supply and fewer disruption from climate events, but are prone to technical breakdowns
- **Rainwater sources** often do not provide a year-round supply of water and are prone to water shortages during dry spells, but have fewer technical breakdowns.
- **Piped surface water** or **spring sources** are the most prone to disruptions from disasters and extreme weather and are most inconsistent in providing a 24-hour supply.

Table 1 – Performance matrix by water sources.

	24-hour supply	Year-round supply	No disruption due to drought or water shortage	No disruption to natural disaster or extreme weather event	No disruption due to technical breakdown
Piped - Groundwater	81%	71%	59%	69%	83%
Piped – Surface or spring	68%	61%	61%	44%	83%
Point sources - Groundwater	86%	60%	38%	63%	93%
Point sources - Rainwater	77%	34%	26%	62%	97%

Proportion of water supplies meeting availability indicators. (Vanuatu Water Resources Inventory, 2021-23)

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Water sources by safely managed criteria

- **Protected Groundwater:** May be on premises and can be piped to premises depending on location, somewhat available when needed (70% availability), but often contaminated.
- **Protected Rainwater:** Often available on premises, somewhat available when needed (60% availability), but can be problematic during dry spells and often contaminated.
- **Protected Springs:** Often not directly on premises but can be piped there, somewhat available when needed (60% availability), and often contaminated.

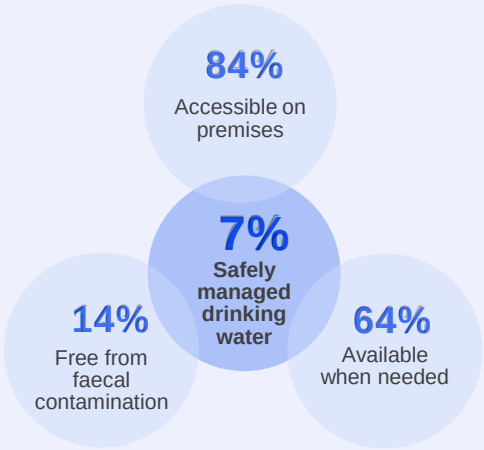


Fig. 7 – Percentage of rural households with safely managed drinking water services criteria (Vanuatu MICS, 2023).

Groundwater and rural water service management and policy

Groundwater supplies (like most rural water supplies) are **managed by communities** through volunteer committees or by private households.

Vanuatu National Water Policy Priorities (2017-2030)

1. High levels of water safety and security
2. Market-based water service delivery
3. Water services compliance
4. Formalise water providers
5. Securing land rights of water assets
6. Strengthening Provincial Council by-laws
7. Secure water future through strengthening coordination

Groundwater in Vanuatu

Challenges

- Groundwater services and products (e.g. drilling, pumps) are **not widely available** on all islands.
- Groundwater potential for safe water supply is **poorly understood**.
- Aquifers in low-lying islands are especially **vulnerable** to **climate change impacts**
- Groundwater development and use is **not widely monitored**

Opportunities

- Groundwater development warrants greater attention due to its relative **resilience to climate change**
- **Solar-pumping systems** present an opportunity to leverage **climate finance**
- Strengthening **monitoring systems** and **regulation of drillers** will support sustainable management

References

Dixon-Jain, P., Norman, R., Stewart, G., Fontaine, K., Walker, K., Sundaram, B., Flannery, E., Riddell, A., Wallace, L. 2014. Pacific Island Groundwater and Future Climates: First-Pass Regional Vulnerability Assessment. Record 2014/43. Geoscience Australia, Canberra., http://dx.doi.org/10.11636/Record.2014.043

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For more information contact jeremy.kohlitz@uts.edu.au