In search of safe and sufficient water: a portrait of household wells in rural Guatemala

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The Trifinio region of south-western Guatemala is geographically and politically isolated. Residents receive few government services and refer to themselves as ‘los abandonados’—the abandoned ones. Most villages lack a functioning, centralized water system. Instead, many residents have dug shallow household wells to meet their domestic water needs.

Amid efforts to update definitions of safe drinking water for global monitoring programmes,1,2 these wells provide a portrait of improvised and imperfect water access. Residents have devised ways to convert closed, mechanical wells into open wells, which allows water access during frequent electrical outages and blurs the definition of protected and unprotected sources. Insufficient and intermittent water supply, as well as suspected contamination, lead families to use different water sources for different purposes and in different seasons, each source with distinct biological and chemical contamination hazards. These water sources also present injury hazards, as residents have been burned by unsafe electrical pump connections and children have fallen into open wells. The wells pictured here challenge us to think about how to define safe, sufficient water access in marginalized communities.

Figure 1. Closed, mechanical pump wells (left) and open, bucket-drawn wells (right). The closed well offers greater protection, but these wells are rarely more than a few metres deep.
Figure 2. Due to frequent electrical outages, many electric pump wells have been built so they can be uncovered and converted to open, bucket-drawn wells. This allows for more reliable water access, but open wells are more vulnerable to contamination.
Figure 3. Wells without headwalls such as this one can easily fill with foul water. They also present a fall risk for young children, as has been reported by residents.

Figure 4. A 55-gallon drum is used as a headwall and plastic sheeting covers the pump and well opening.
Figure 5. Shallow wells are often located in yards shared with domestic animals, cars and other machinery: potential sources of microbial and chemical contamination.

Figure 6. Unreliable piped water necessitates back-up water sources. These wells are the first (left) and second (right) back-up sources for a household in a community where piped water is typically available for an hour each morning. This type of back-up system is common, allowing more abundant water access, though often at the price of time and quality, as each successive back-up is typically further from the house and has greater contamination risks than the preceding sources.
Figure 7. This tower is a remnant of a defunct piped water system. The community lacks the funds necessary to repair a broken pump connected to this tower. Distrust of government services, perceived mismanagement of funds and distance from municipal centres pose major challenges for establishing sustainable community drinking-water systems in this region. The question remains: what can be done to improve access to safe and sufficient water in the Trifinio?
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