

Drinking Water Quality in Rural Sub-Saharan Africa

A Pilot Assessment in Rongo Sub-County, Kenya

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BACKGROUND:

- Rongo Sub-County (pop. 125,000) is a rural collection of farming and mining communities located in Northeastern Migori County, Kenya
- The area lacks centralized water delivery or treatment infrastructure, and data on drinking water quality is scarce and costly to obtain
- This pilot project was the first to systematically evaluate the bacteriological and chemical parameters in the area's rain- and groundwater-sourced drinking water resources

METHODS:

- A total of 90 drinking water grab samples were collected from roof-draining water tanks, rehabilitated springs, naturally-occurring water sources, and hand-dug wells
- The presence of pathogenic bacteria and 12 chemical drinking water parameters, including copper, nitrate, and lead, were assessed using commercially available colorimetric testing kits
- GPS coordinates of each site's location were logged to inform Lwala Community Alliance's community health development efforts
- Community education sessions were held as needed throughout the field work period

OUTCOMES:

- This assessment was the first broad survey of drinking water quality in Rongo's communities
- This project laid the procedural groundwork for continued environmental monitoring
- Water, sanitation, and hygiene guidelines were updated to protect vulnerable populations
- Longitudinal monitoring is needed to spatially expand the scope of this pilot project and confirm findings across seasonal contexts

Of 57 groundwater sites assessed, 31 (54%) tested for nitrate levels at or above NEMA* drinking water limits (10 mg/L)

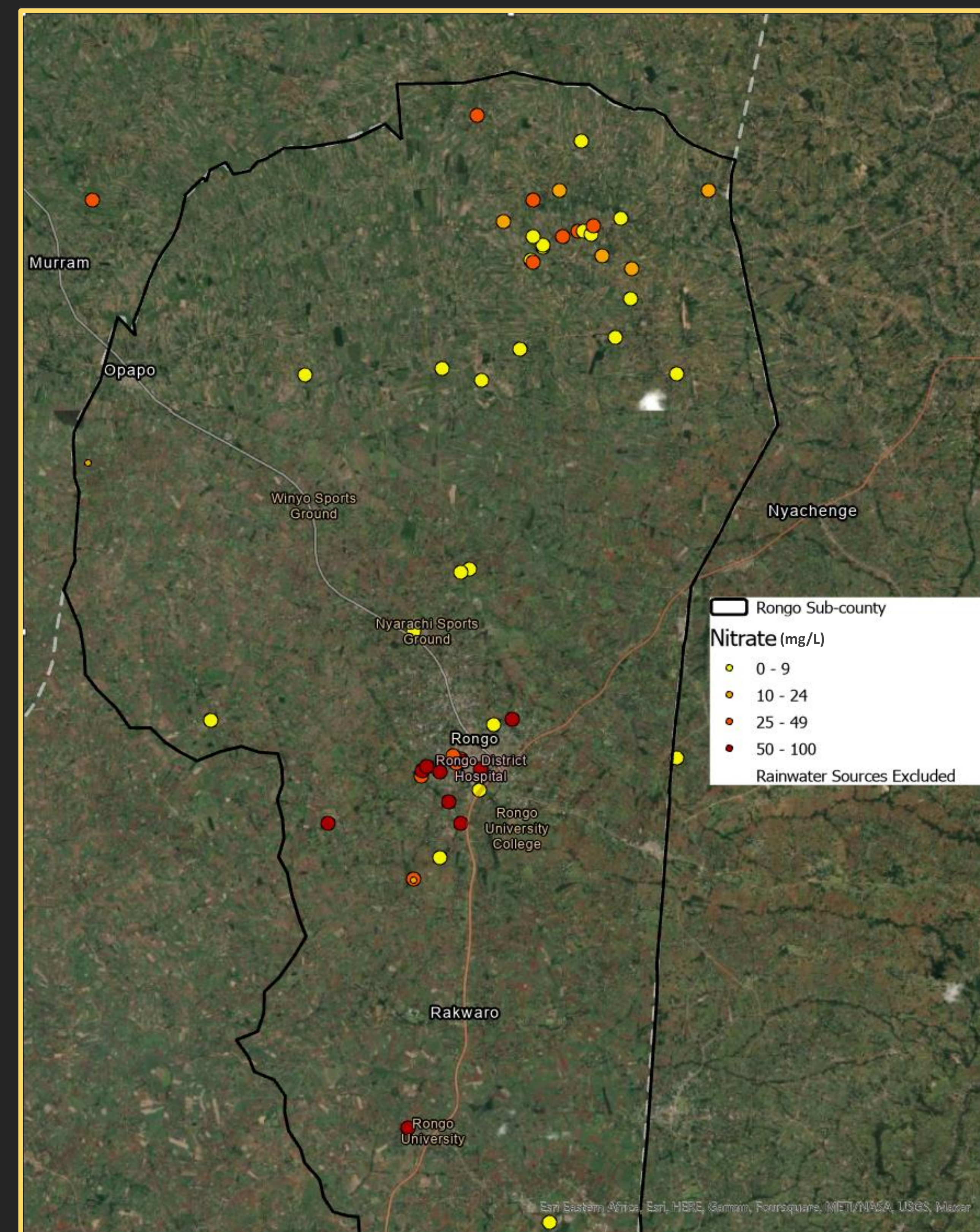


Fig. 1. Spatial distribution of groundwater nitrate concentrations in East, North, and Central Kamagambo Wards

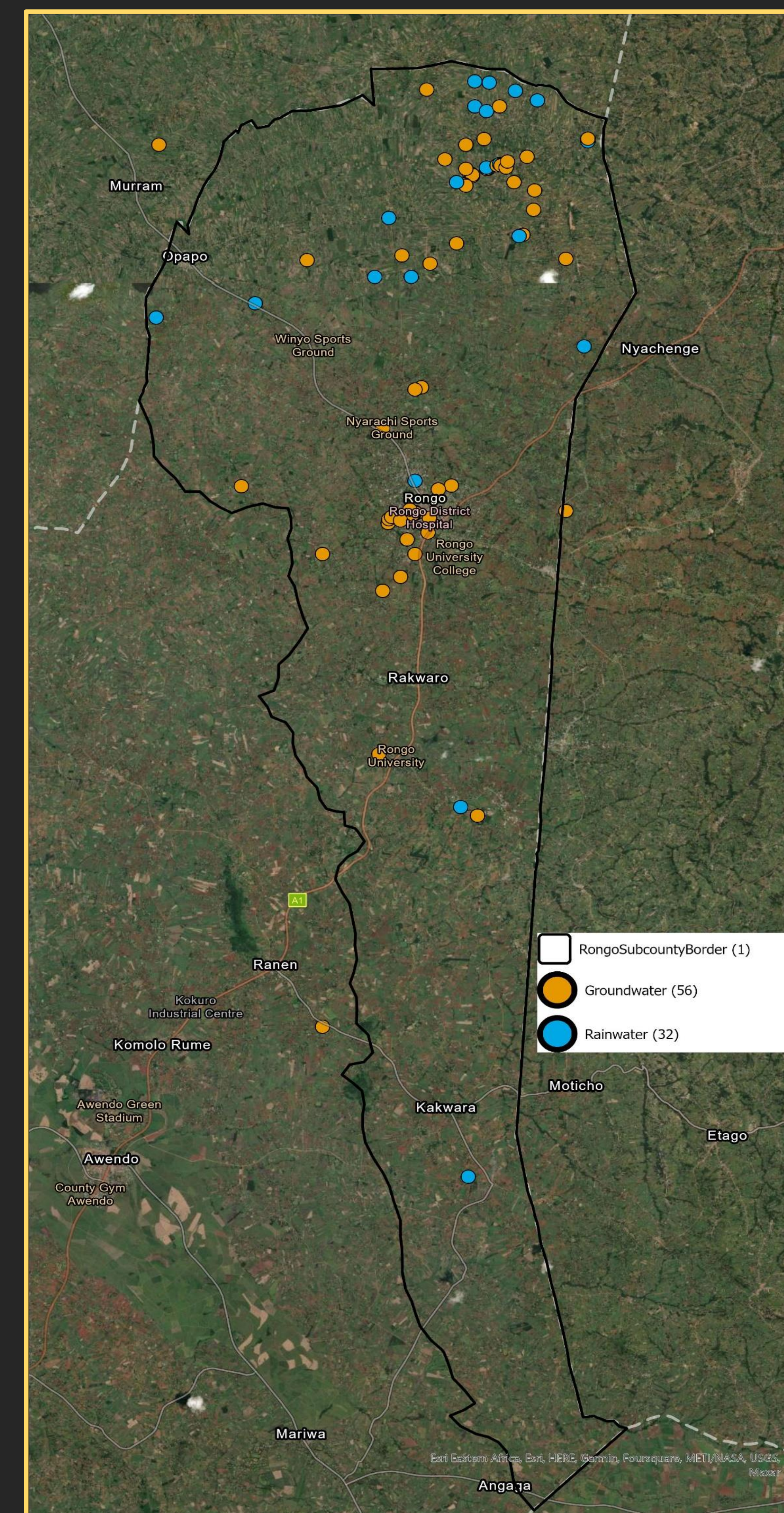
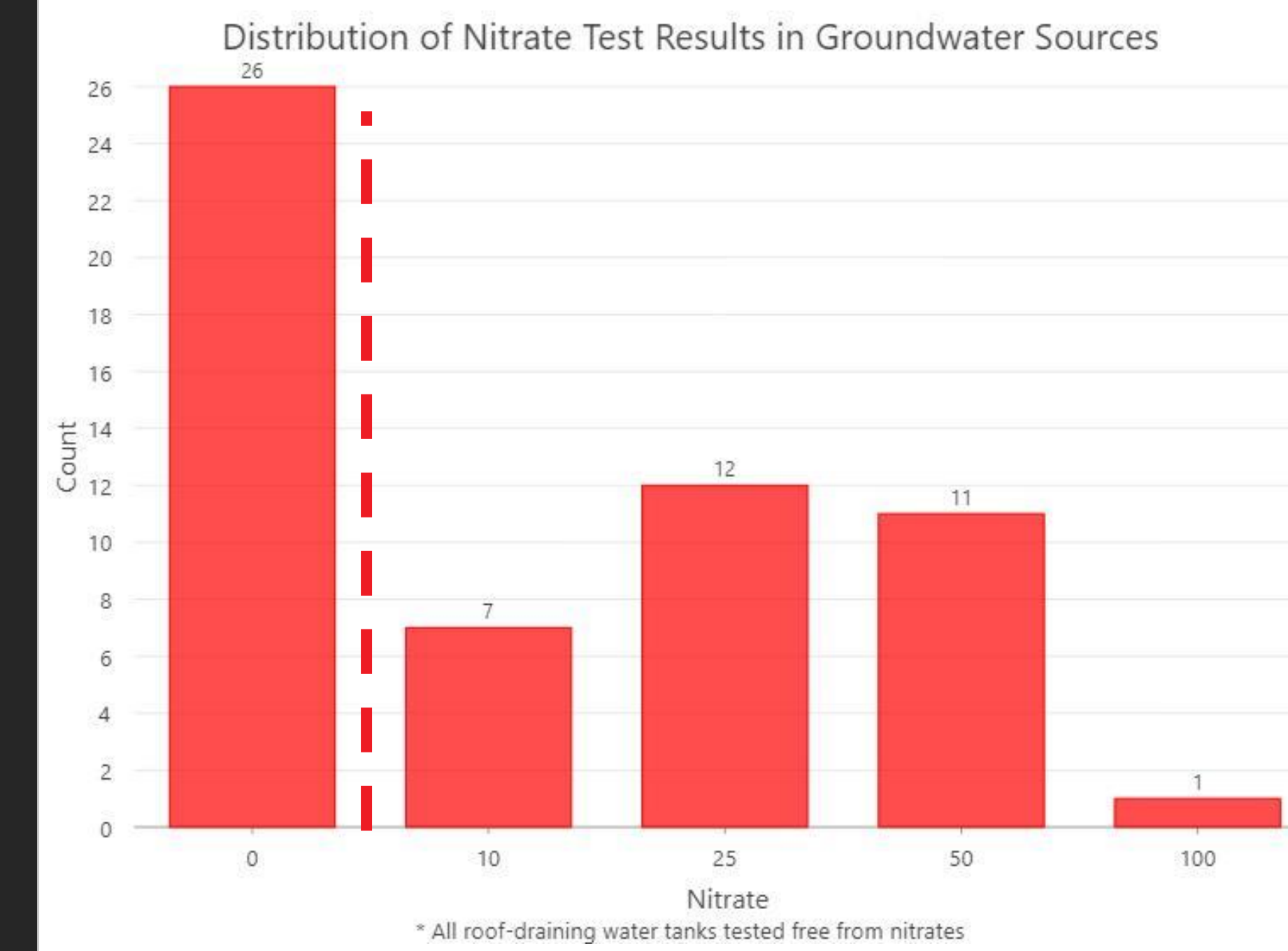
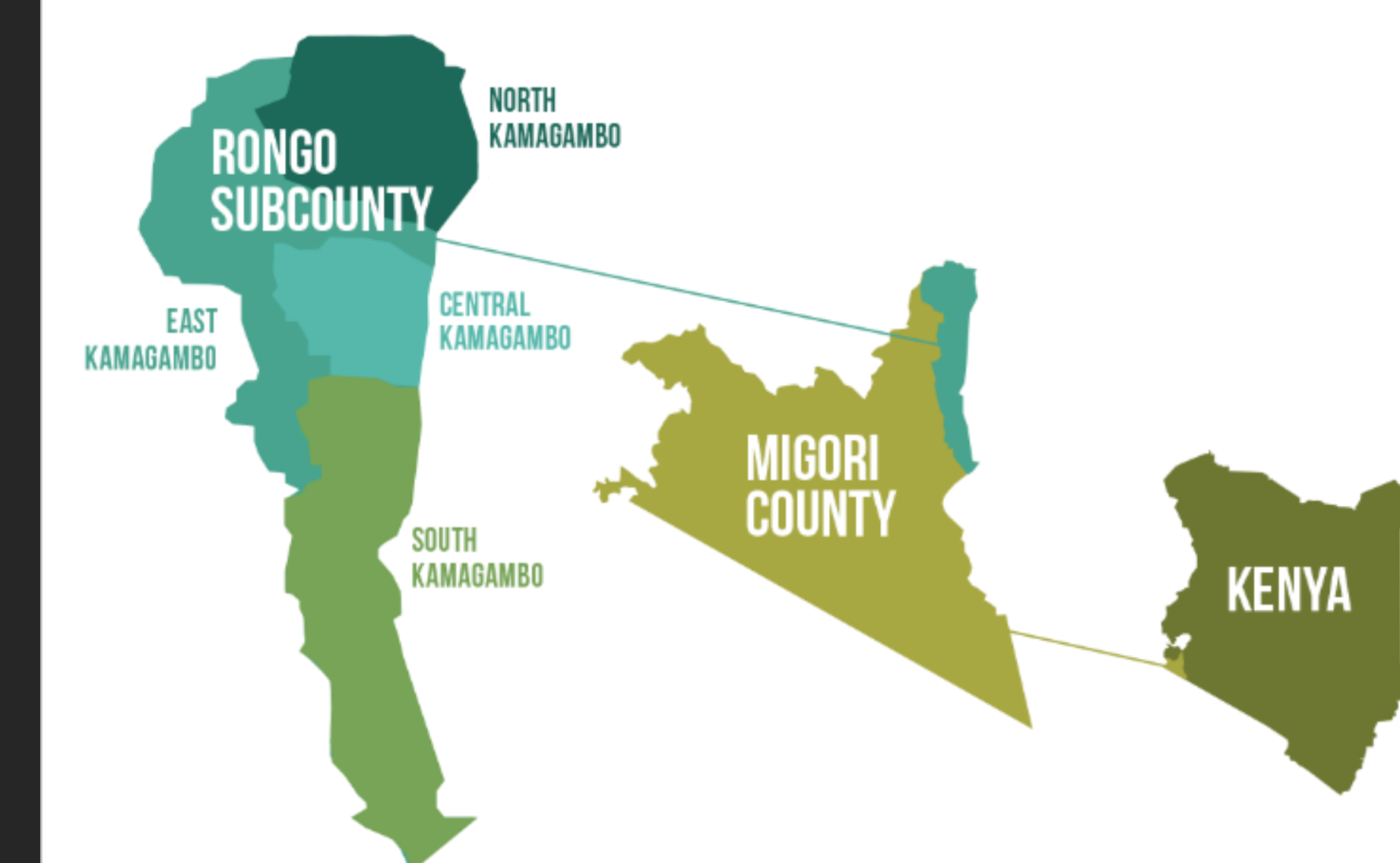
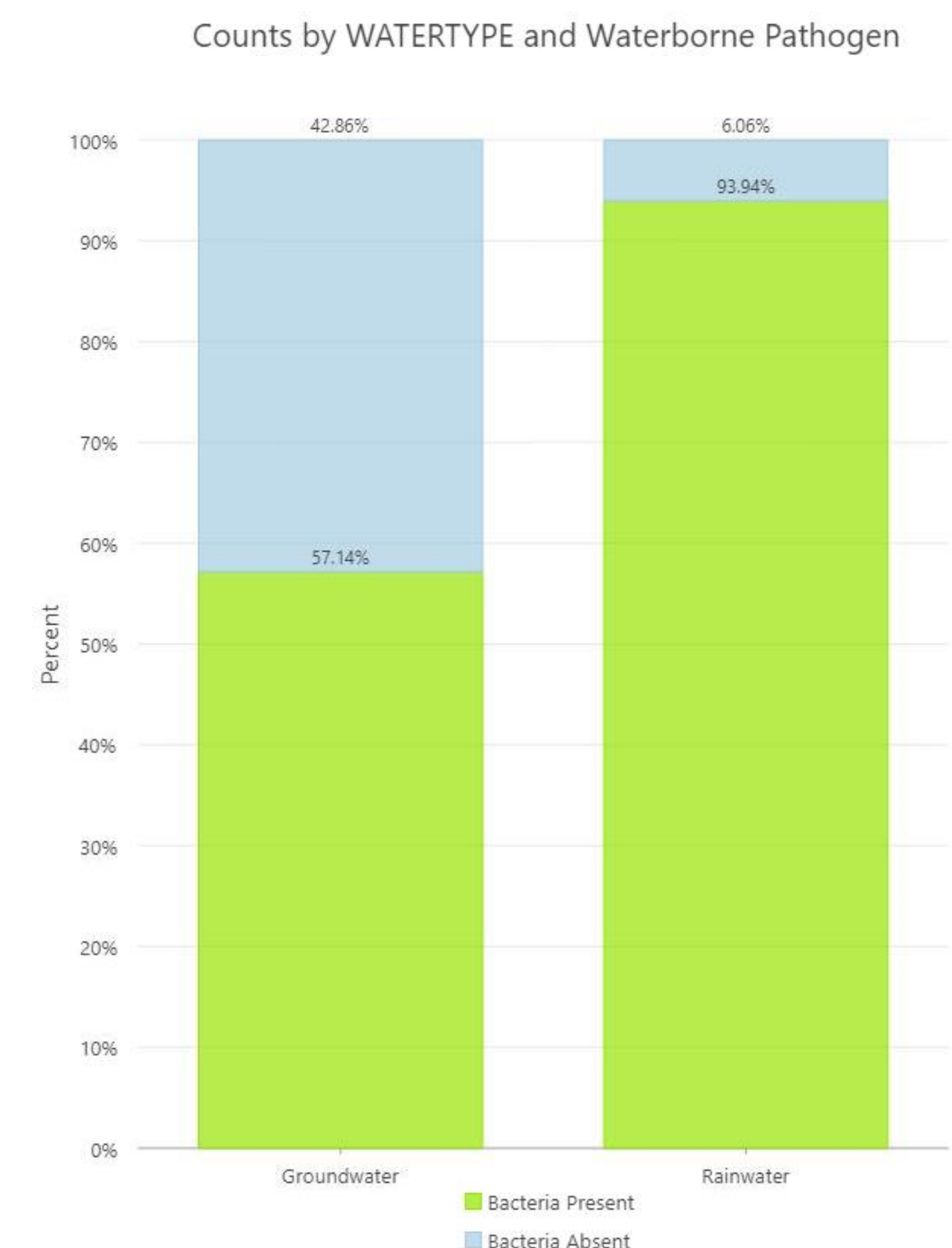


Fig. 2. Spatial distribution of all assessed sources, Rongo Sub-County



- Nitrate (NO_3) is a water-soluble pollutant produced by septic system leaks, fertilizer runoff, and animal waste
- Nitrate limits are set at 10 mg/L (ppb) by both the EPA and NEMA to protect against methemoglobinemia ('blue baby syndrome') in infants under 6 months old
- Concentrations lower than 10 mg/L may still raise the risk of birth complications, colorectal cancers, and thyroid disease



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