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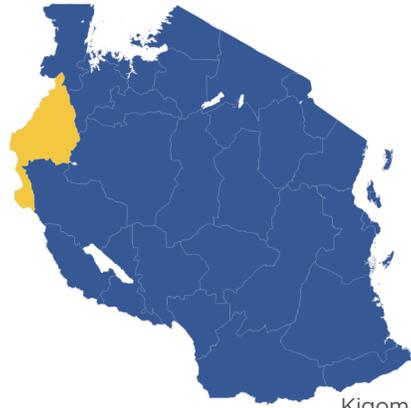
# SWOT FIELD IMPLEMENTATION REPORT

Nyarugusu Refugee Camp, Kigoma Province, Tanzania  
UNHCR | NRC

JUNE 2021



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Kigoma Province, Tanzania

## BACKGROUND

Nyarugusu refugee camp hosts around 132,000 refugees who have fled violent conflict in DRC and Burundi. The camp was opened in 1996 and experienced rapid influxes in 2015 and 2017. Nyarugusu is one of three formal refugee camps in Kigoma Province where UNHCR and partners are providing WASH services to refugees.

## THE SITE

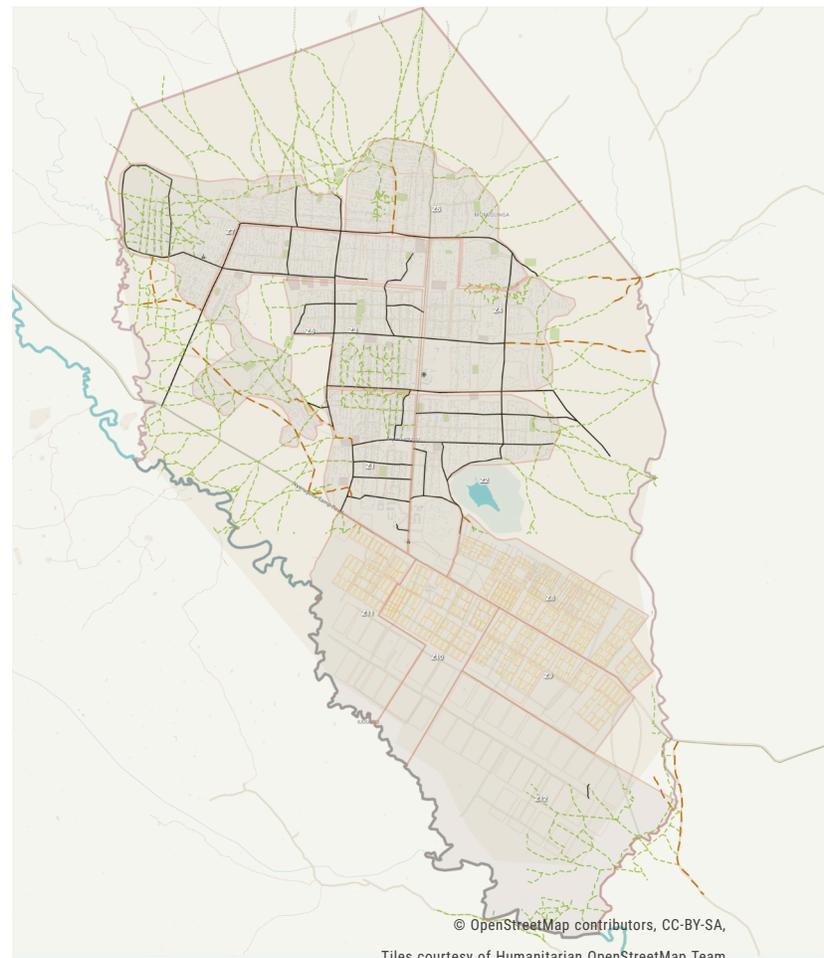
Nyarugusu is a large camp, spread out over about 16sq.km of land close to the border with Burundi. Living conditions are different across the camp, although in general WASH conditions are good. UNHCR monitoring shows that average water availability is between 26 and 33l/p/d. Water sources include both boreholes and river intakes which feed a water network which spans the camp. 73% of shelters are located within 200m of a tapstand. (see figure 3).

**454 $\mu$ S/cm**

Mean conductivity

**23.0 $^{\circ}$ C**

Mean water temperature



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Tiles courtesy of Humanitarian OpenStreetMap Team

Nyarugusu Refugee Camp



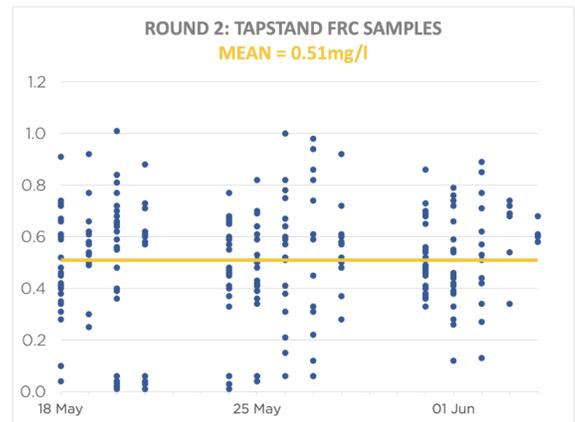
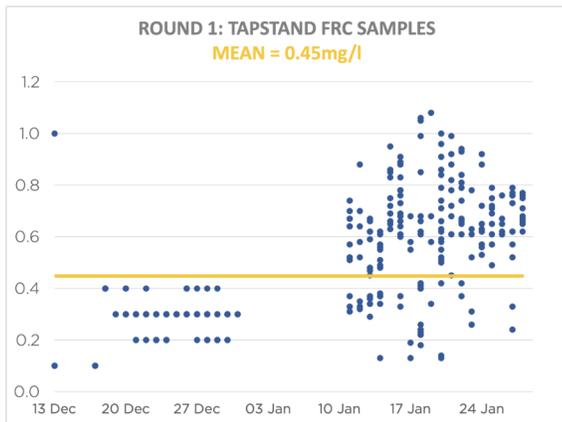


Figure 1: FRC measured at tapstands during round 1 and round 2

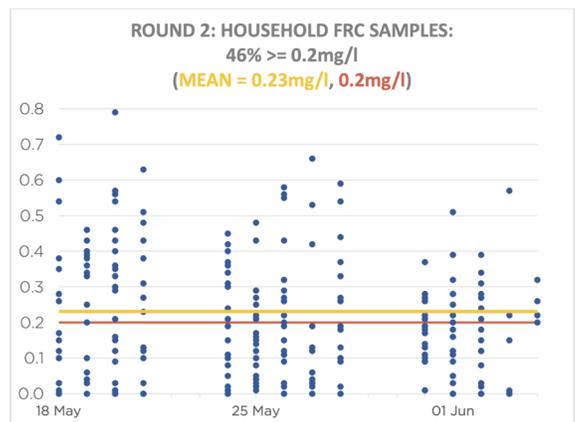
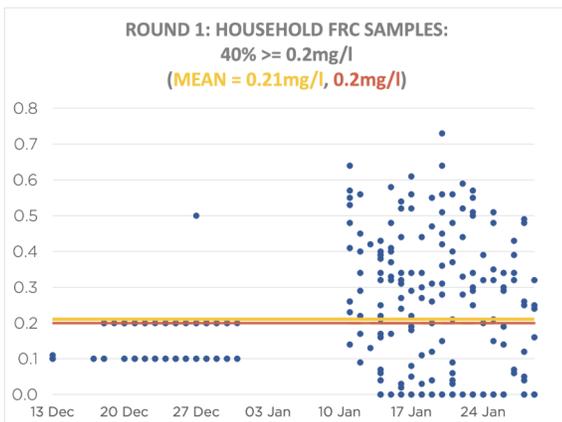


Figure 2: FRC measured at households during round 1 and round 2, showing protective FRC (0.2mg/l)

## DATA COLLECTION

UNHCR and NRC carried out periodic SWOT data collection as part of water quality assessments in two phases:

- **Round 1:** 404 paired samples collected between December 2019 and January 2020
- **Round 2:** 263 paired samples collected between May and June 2021

Data collection was carried out using mobile phones running KoBo Collect using a monitoring survey form that was adapted to collect data that could be uploaded directly to the SWOT for analysis.

In addition to FRC, water temperature and conductivity measurements, GPS points were also captured to enable mapping of water quality across the site. This is particularly important because the large size of the camp implies that significant variations in water quality are possible.

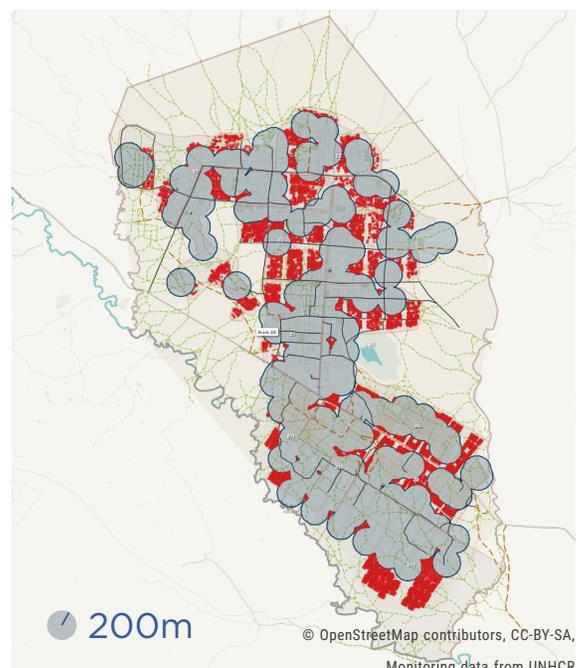


Figure 3: Tapstand location, red dots show shelters >200m from the nearest tapstand



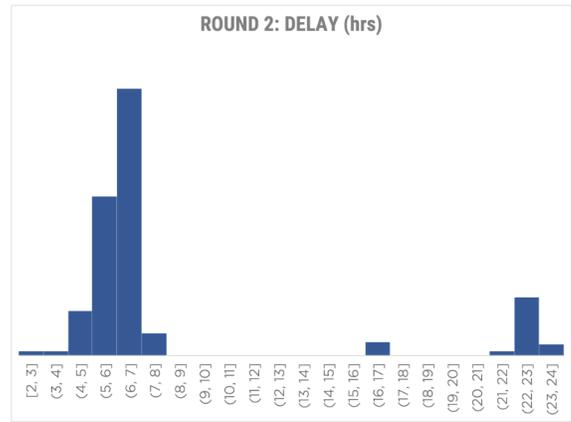
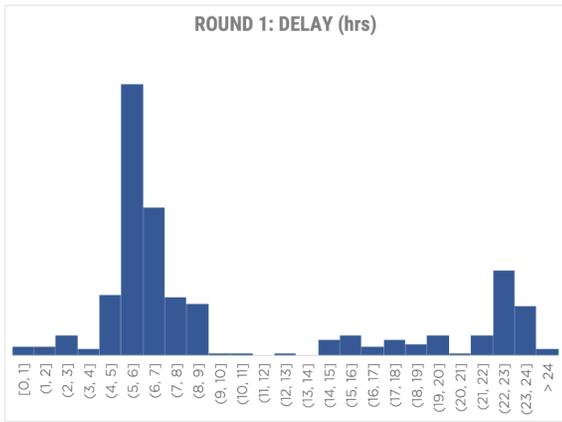


Figure 4: Delay between tapstand and household samples

## RESULTS:

Round 1: For an 18-hour duration of protection, the SWOT generated a tapstand FRC recommendation of 0.75 mg/L.

Figure 5 depicts a retrospective empirical analysis of how the SWOT recommendation compares to the status quo Sphere FRC target (i.e., 0.2 - 0.5 mg/L) with respect to ensuring household water safety (i.e., FRC > 0.2 mg/L) in data where household follow-up occurred between 18 +/- 3 hours post-distribution (n=34, average post-distribution time: 17.6 hours).

Round 2 data analysis is yet to be conducted on the new dataset.

## LESSONS:

Challenges were faced working remotely with multiple agencies. The SWOT team has developed additional training materials to support field teams to get started.

The large size of the camp and complexity of the water supply system has highlighted the opportunity to improve the spatial analysis of results, to ensure that water supply operators have the information they need to make specific adjustments to chlorination.

SWOT Engineering Optimization Model - Empirical Back-Check at 15-21h follow-up (average 17.6h, n=34)  
Dataset: TZAMay113\_HUCL\_TESTSite\_20210511T17420000Z\_18\_optimumDecay  
Code Version: 1.6

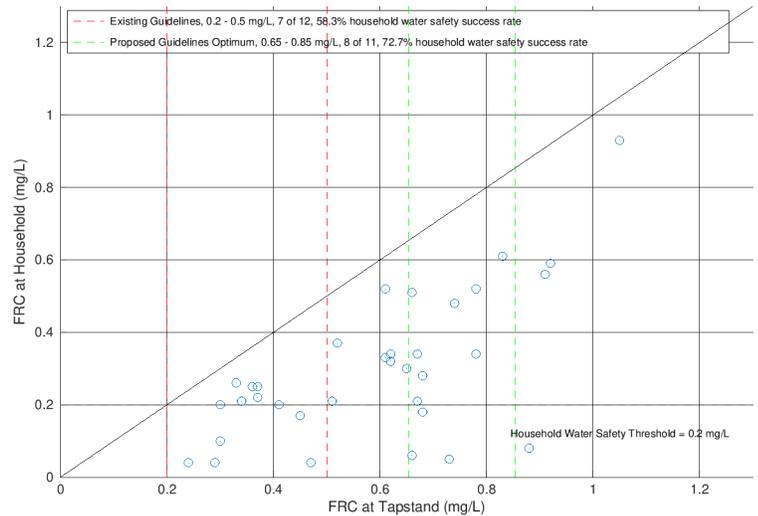


Figure 5: Empirical back-check of the round 1 SWOT results

## NEXT STEPS:

UNCHR and NRC will continue periodic data collection at Nyarugusu and nearby Nduta camps, in line with regular household and community level monitoring.

The SWOT team aim to include further geo-spatial analysis of water quality measures in future updates to the SWOT webtool.

UNHCR has indicated desire to expand SWOT water quality monitoring to all camps in Tanzania.

