

VISIBLE AND SILENT CONTAMINANTS IN HOUSEHOLD DRINKING WATER SOURCES:A ONE HEALTH APPROACH TO COMMUNITY WATER SAFETY IN AKONOLINGA, CAMEROON

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WATER SOURCES IN AKONOLINGA



OPEN WELLS
Exposed to runoff, waste and debris



STREAM
Used for drinking, washing and other activities



BOREHOLE
No chlorine



HOUSEHOLD STORAGE
Uncovered containers, dirty surroundings



RIVER
Often with visible particles and foul odor

Water may look clear, but it can still carry dangerous invisible contaminants that cause serious illness.

INTRODUCTION

Access to safe drinking water remains a major public health challenge in rural communities in Cameroon. In Akonolinga, households obtain water from rivers, open wells, boreholes, streams, and rainwater. Although water may appear clean, it can still contain contaminants that are not visible to the human eye. This study applies a One Health approach to understanding household water safety and identifying opportunities for community-based interventions.

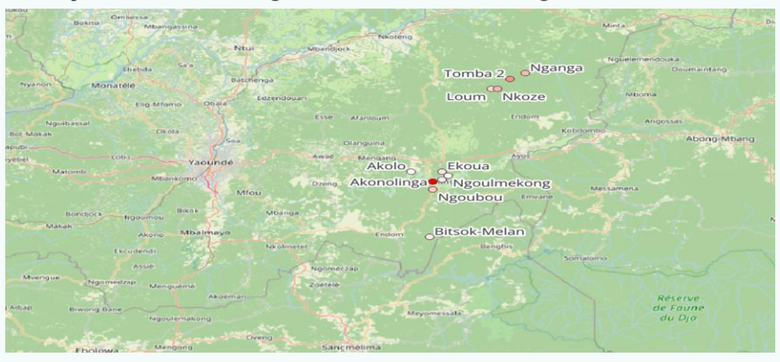
OBJECTIVES

- ✓ Assess the physical (visible) and chemical (silent) quality of household drinking water sources.
- ✓ Compare water quality with WHO guidlines and Cameroon NS 14-60 standards.
- ✓ Examine associations between water quality and self-reported health outcomes amongs households.
- ✓ Explore household water handling practices and how they may influence water safety.

METHODS AND MATERIALS

Study Design: Cross-sectional household survey with water sampling.

Study Area: Rural neighborhoods in Akonolinga.



Sample Size: 158 households.

Water Sources: Boreholes, Wells, streams, rivers and rain water

Analysis:

- Physical: turbidity, color, odor
- Chemical: pH, nitrate, nitrites, chlorine residual

Data Collection: Structured questionnaires and Kobo Collect

Standards: WHO Guidelines for Drinking-water Quality and Cameroon NS 14-60.

TWO KINDS OF CONTAMINANTS. ONE HEALTH CHALLENGE

VISIBLE CONTAMINANTS	SILENT CONTAMINANTS
What we can see	*What we cannot easily see*
Turbidity (cloudy water)	Bacteria
Color and odour	Nitrates and nitrites
Sediments and debris	Heavy metals
Algae and organic matter	Low or absent chlorine residual
	Extreme pH (too acidic or too alkaline)

Both visible and silent contaminants can cause **diarrhea, typhoid, cholera, skin infections, anemia, methemoglobinemia** and other long-term health effects.

POSSIBLE HEALTH OUTCOMES

Self-reported health outcomes among surveyed households included:

- ❖ Diarrhea
- ❖ stomach aches
- ❖ skin infections,
- ❖ typhoid-like symptoms
- ❖ fatigue associated with reported anemia.

Children affected with skin infections.



Study Participants and Field Activity





RESULTS AND DISCUSSION

95%
of sampled water sources had acidic pH levels below the recommended standard.

70%
of sampled sources had no detectable residual chlorine, indicating inadequate or absent disinfection.

54.4%
of caregivers reported giving untreated water to infants and young children.

23.4%
of households had a latrine or farming activity within 15 metres of their water source.

Nitrate and nitrite levels were generally within WHO limits. However, the study identified localized nitrate contamination, which may be particularly important when considering water consumed by infants.



Nitrite

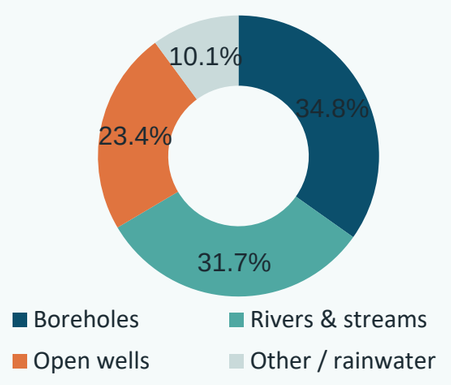


Ph and chlorine



Nitrate

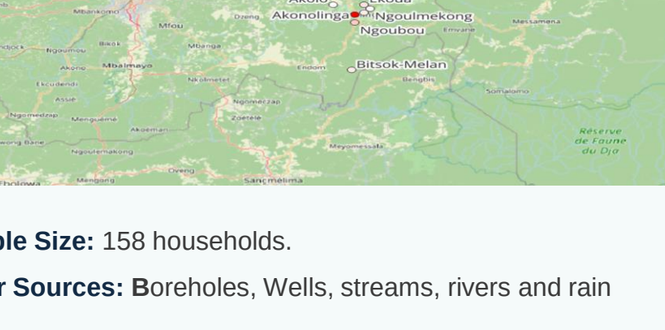
HOUSEHOLD WATER SOURCES



CONCLUSION & WAY FORWARD

- Improving community water safety requires addressing visible and silent contaminants across the whole water chain: source → collection → storage → consumption.
- A One Health approach coordinates households, community leaders, health services, water authorities, agricultural services and researchers.
- Multisectoral collaboration offers a sustainable pathway to reduce preventable water-related illness, protect vulnerable populations and strengthen resilient rural health systems in Cameroon.

A One Health Framework



158
Households

10
Villages

4
Sections of Survey

RECOMMENDATIONS

- Treat water at household level (boiling, chlorination, filtration).
- Store safely in clean, covered containers.
- Keep water sources away from latrines and waste sites.
- Promote handwashing and hygiene practices.
- Regular water quality monitoring by local authorities.

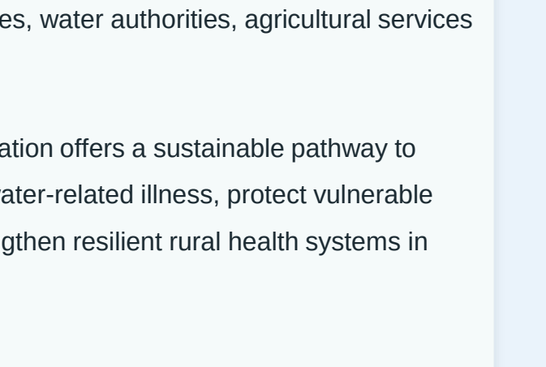
Small actions at the household level — treating, storing and protecting water — can prevent major outbreaks of waterborne disease in the community.

CLEAN WATER IS A RIGHT.

SAFE WATER IS A CHOICE.

Improving water quality today prevents disease tomorrow.

Akonolinga deserves safe water.



Study Area: Akonolinga, Centre Region, Cameroon

Together for healthier communities.

Safe Water. Healthy Lives. Strong Communities.