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Laboratory protocol for bacteriological and physico-chemical technique in water sample analysis

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ABSTRACT

Introduction: The Sustainable Development Goal (SDG) 6 coordinates international efforts toward “clean water and sanitation”. Water contaminated with diarrheal bacteria or thermotolerant coliforms (TTC) will not achieve the SDGs in the lives of people around the world. In contribution, our research in Ethiopia demonstrates that current international standards around water access have not properly specified standards around *water quality*. The aim of this study is to assess the water quality parameters of basic water services in Amhara and Afar regions of Ethiopia as well as the role and importance of local managerial committees in ensuring water functionality. Our findings demonstrate that 34% of functional water services in Ethiopia are reclassified as non-functional once tested for TTC.

Methods: This mixed methods research, took place from January to June 2019, sampled 22 districts from government lists of food-insecure areas in the Amhara and Afar regions of Ethiopia. Within each district, 111 water services, classified as “basic,” and their associated WASHCos were randomly selected. Mixed methods research included testing of water quality samples, observation of water sources, interviews and focus group discussions with WASHCo members. Chi-square tests and binary logistic regression were used to determine the associations of variables at 95% CI and 5% level of significance (p-value of <0.05).

Results: 34% of “functional” basic water had non-potable water due to TTC. The interview and FGDs identified poor management, absence of skilled technicians and lack of spare parts as chronic reasons for non-functionality. In multivariable regressions, the odds of having functional basic water services in Amhara and Afar regions of Ethiopia were 8.006 times more likely when the WASHCos knew their duties and accountabilities than when they did not know. The odds of having functional basic water services were 30% more likely when the detection of Total Coliform Count in CFU/100 ml decreases.

Conclusion: Our findings from Amhara and Afar regions of Ethiopia emphasize the importance of water quality to be added to the definition of basic water services in the global development indicators. Upon testing for water quality, 38 (34.23%) of “functional” water services are reclassified as “non-functional” water services. Our findings from Ethiopia suggest that additional research should be undertaken in other developmental contexts to assess the percentage of basic water services that, when water quality is taken into account, are found to be non-functional.

ATTACHMENTS

S2_File.pdf.pdf

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null, [Basic water services, Ethiopia, Functionality, and Water quality]

IMAGE ATTRIBUTION

Growth of the thermotolerant microorganisms using membrane filter technique in water samples in Amhara and Afar regions of Ethiopia

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