UNESCO-IWRA ONLINE CONFERENCE
17-19 JANUARY 2023
3RD IN THE IWRA ONLINE CONFERENCE SERIES

Emerging Pollutants: Protecting Water Quality for the Health of People and the Environment

Presentation Title: Groundwater contamination with Sulfamethoxazole and trimethoprim and spread drug resistant of E.coli in informal settlements; Kenya

Ms. Kellen Joyce Karimi

18th January 2023, 11:30 CET

unesco
Programme hydrologique intergouvernemental

IWRA International Water Resources Association

Purpose, Context and Methodology

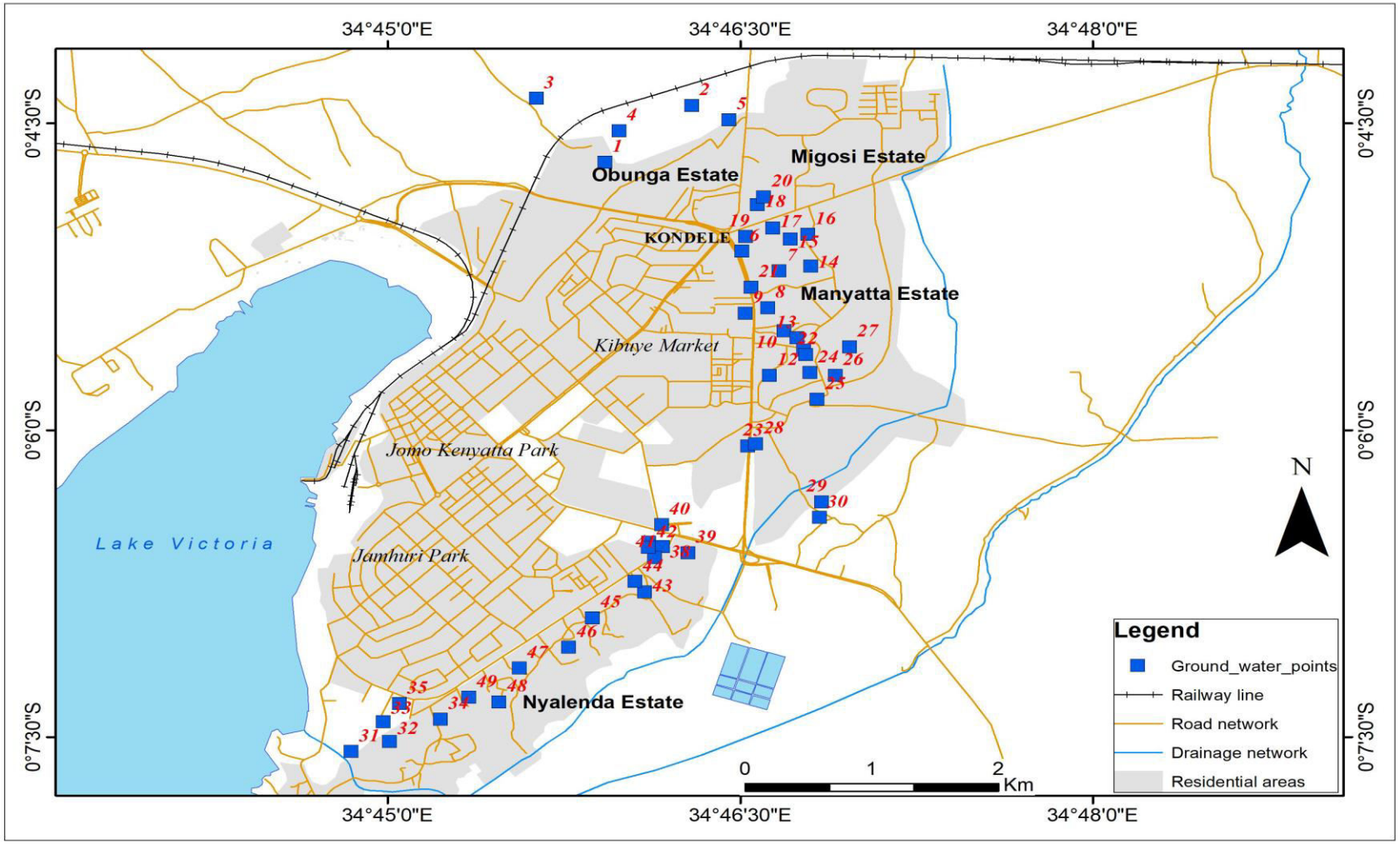
Purpose: Part of a Doctoral study, investigating contamination of groundwater with Antibiotics (Sulfamethoxazole and trimethoprim)

Context: Prevalence of antibiotic use in the settlements at 43%, occasioned by misuse and improper disposal; makes it difficult to determine cause of resistance in the environment

Informal settlements are densely populated, therefore pollution is higher due to inadequate sanitation facilities; reliance on groundwater exposes the populace to risk of pollutants and antibiotic resistance

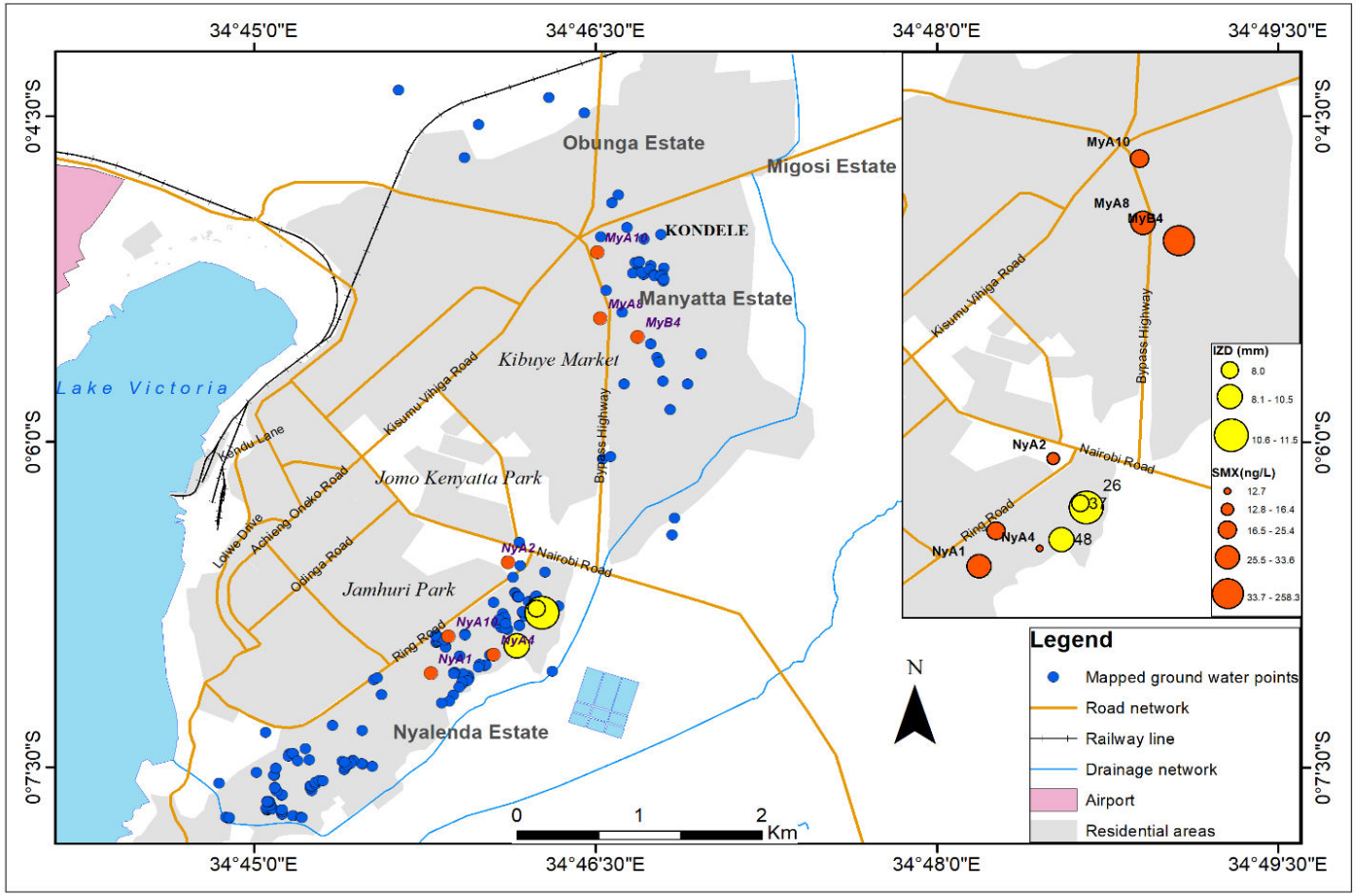
Antibiotics SMX and TMP are used mostly for prophylaxis and treatment among HIV/AIDS patients; The study area reports a HIV/AIDS prevalence than the national figure

Methodology



- Cross sections study
- 49 water points were sampled
- SMX and TMP analyzed using SPE-LC-MS/MS.
- Kirby Bauer method was used to determine antibiotic sensitivity against *Escherichia coli*

Results



Code	Sample	SMX (ng/L)	SD
NyA4	1	12.7	1.1
MyA10	6	25.4	10.6
MyA8	9	33.6	9.5
MyB4	10	258.2	27.4
NyA10	14	24.6	1.1
NyA2	18	16.4	0
NyA1	20	29.9	8.4

IZD

0.8 mm- #37

10.5 mm-#48

11.5 mm- #26

Policy implications

- Amount of antibiotics that cause resistance in the environment is unknown

- SMX must be closely monitored and further investigation of triggers of resistance in the study area to determine possibility of spread of resistance

THANK YOU