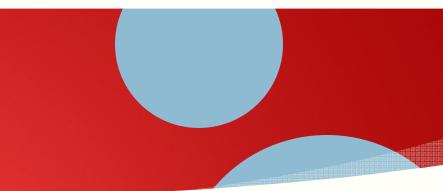


KABARAK UNIVERSITY 6TH ANNUAL INTERNATIONAL RESEARCH CONFERENCE

An assessment of the impacts of gypsum mining on water quality in Kajiado County, Kenya

OMOTI, K. M; KITETU, J. J; KERIKO. J. M.

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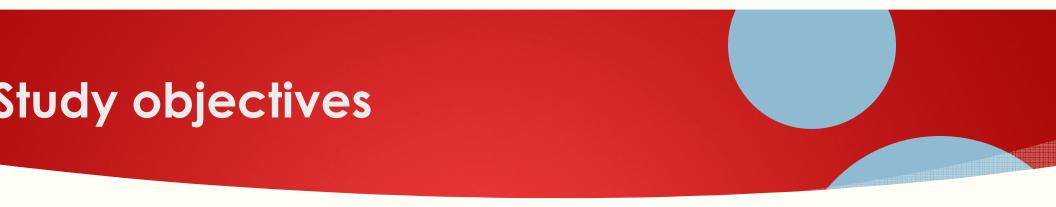


ntroduction / Background

- Increased mining activities in Kenya, targeting titanium, gypsum gold to name a few
- . Extractive industry is potentially an important contributor to water pollution

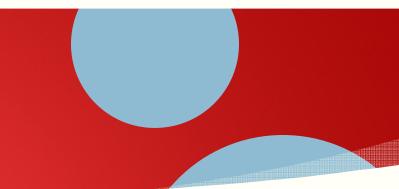
Statement of the problem

- Gap in the analysis of effects of gypsum mining on water quality
- . Gypsum mining literature on water quality effects lack in details
- i. If nothing is done water pollution and consequent health effects might increase



The study sought to Investigate the Impacts of gypsum mining operations on the quality of water quality in Kajiado County

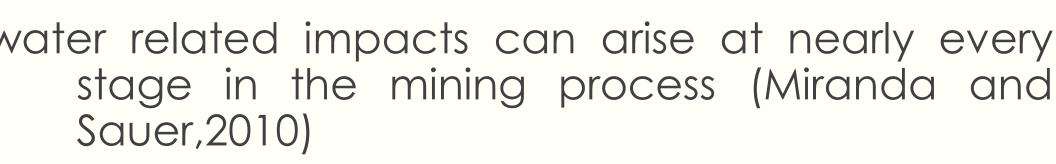




vater impacts could those that lead to a decline in the quality of natural water, making it unsuitable for use

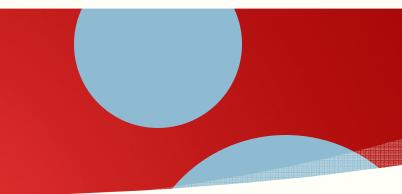
The alteration of biological, Physical and chemical properties of water (Magombedze, 2006).



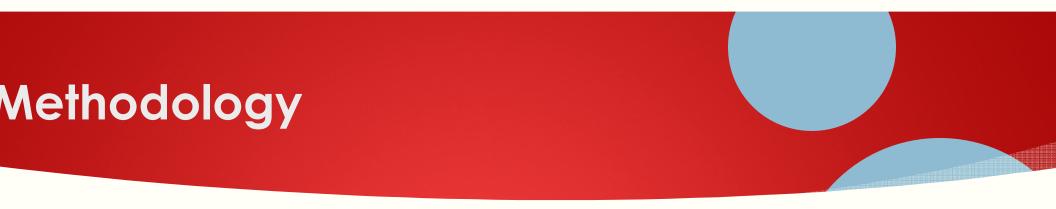


Changes in parameters above acceptable levels can result in serious health challenges to the local population (Odira *et al*, 2012; Ternjej *et al*, 2014).





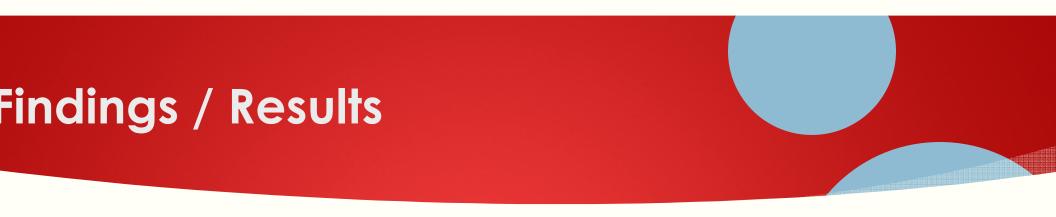
- The level and type of water contamination depends on the nature of mineralization, mining methods and processing chemicals
- Most critical changes occur as a result of leaching from stock piles and point discharges of mine drainage (Mestre, 2009; Nude et al, 2011).



- Primary data obtained using interviews, questionnaires and field measurements.
- Samples taken at selected sites and subjected to physical, chemical and bacteriological examinations Secondary data collected by reference to public health records on disease incidence in the study area



- **B**acteriological analysis revealed higher Coliform concentrations in surface water samples than those observed in ground water samples.
- . Mean total coli form in the surface water samples was 555/ 100 ml (allowed 3)

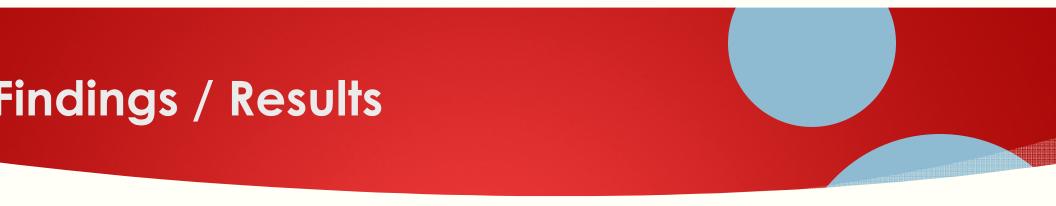


- Bacterial pollution in water provides evidence of recent faecal pollution
- Contamination confirms the influence of anthropogenic activities near the mine ponds (WHO, 2006; Attia, 1999).

Findings / Results

- insignificant elevation in the concentrations of trace metals pollutants in ground water samples.
- Surface water parameters exceeded the WHO (2006) recommended guideline values for the specific parameters
- Nitrates in surface water samples was 10.1 mg/L while nitrates concentration in ground water was 1.74

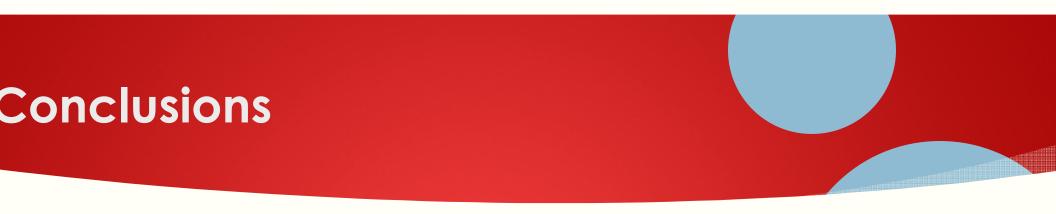
arameter	Units	Mean	Median	Min.	Max.	NEMA Value	
Н	pH Units	8 ± 0.08	8.010	7.400	8.660	6.5 – 8.5	
urbidity	N.T.U	80.10 ± 0.57	121.5	1.380	156	-	
onductivity	μS/cm	28203 ±3664	27422	2429	48830	-	
otal Hardness	mg/L caCO3	1102 ± 24.29	1124	952	1252	-	
litrates	mg/L NO3	10.12 ± 0.41	10.3	6.800	12.7	10	
SS	mg/L	878 ± 189.25	598.5	100	2370	1200	
otal Coli forms	per/100 ml	555 ± 167.93	180	75	2400	-	
-Coli	Per/100 ml	47.8 ± 10.16	30	7	150	Nil	
inc	Zn mg/L	0.033 ± 0.01	.015	.01	.002	1.5	
admium	Cd mg/L	0	0	0	0	0.01	
ead	Pb mg/L	0	0	0	0	0.05	
opper	Cu mg/L	$.024 \pm 0.02$.015	.01	.03	0.05	20/0



relationship between probable water contamination and disease incidence

waterborne diseases including diarrhoea, dysentery, typhoid fever and intestinal worms accounted for 20.3% of the under 5 year old cases

No significant difference in the disease burden for children aged below 5 years and the rest of the population ($p \le 0.206$).

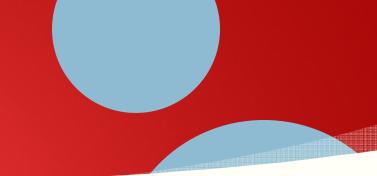


- . water samples collected from mine pits, confirm presence of bacterial organisms including E-coli
- water resources near mining sites were so unsafe that they escalated disease outbreaks in the affected communities
- The elevated bacterial levels are more of an indirect impact of gypsum mining on water resources than a direct one



The study recommends training and extension services aimed at prevention of diarrheal and other waterborne diseases





A geological survey in the study area to determine trend changes on water table since the inception of mining in Kajiado County

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