

# ASSESSMENT OF WATER SUPPLY AND SANITATION INFRASTRUCTURES IN URBAN ENVIRONMENT OF CAMEROON AND PERSPECTIVES UNDER LOOMING CLIMATE CONDITIONS. CASE STUDY OF THE CITY OF KUMBA, MEME DIVISION, SOUTH WEST REGION OF CAMEROON

Celestin Defo

Higher Institute of Agriculture, Forestry, Water and Environment,  
University of Ebolowa, Cameroon

Global South Academic Conclave on WASH and Climate linkages

2<sup>nd</sup> - 4<sup>th</sup> February 2024, Ahmedabad

**CWAS** CENTER  
FOR WATER  
AND SANITATION  
**CRDF** CEPT  
UNIVERSITY

BILL & MELINDA  
GATES foundation



# PLAN OF THE PRESENTATION

- **INTRODUCTION**
- **MATERIALS AND METHODS**
- **RESULTS AND DISCUSSION**
- **CONCLUSION AND RECOMMENDATIONS**

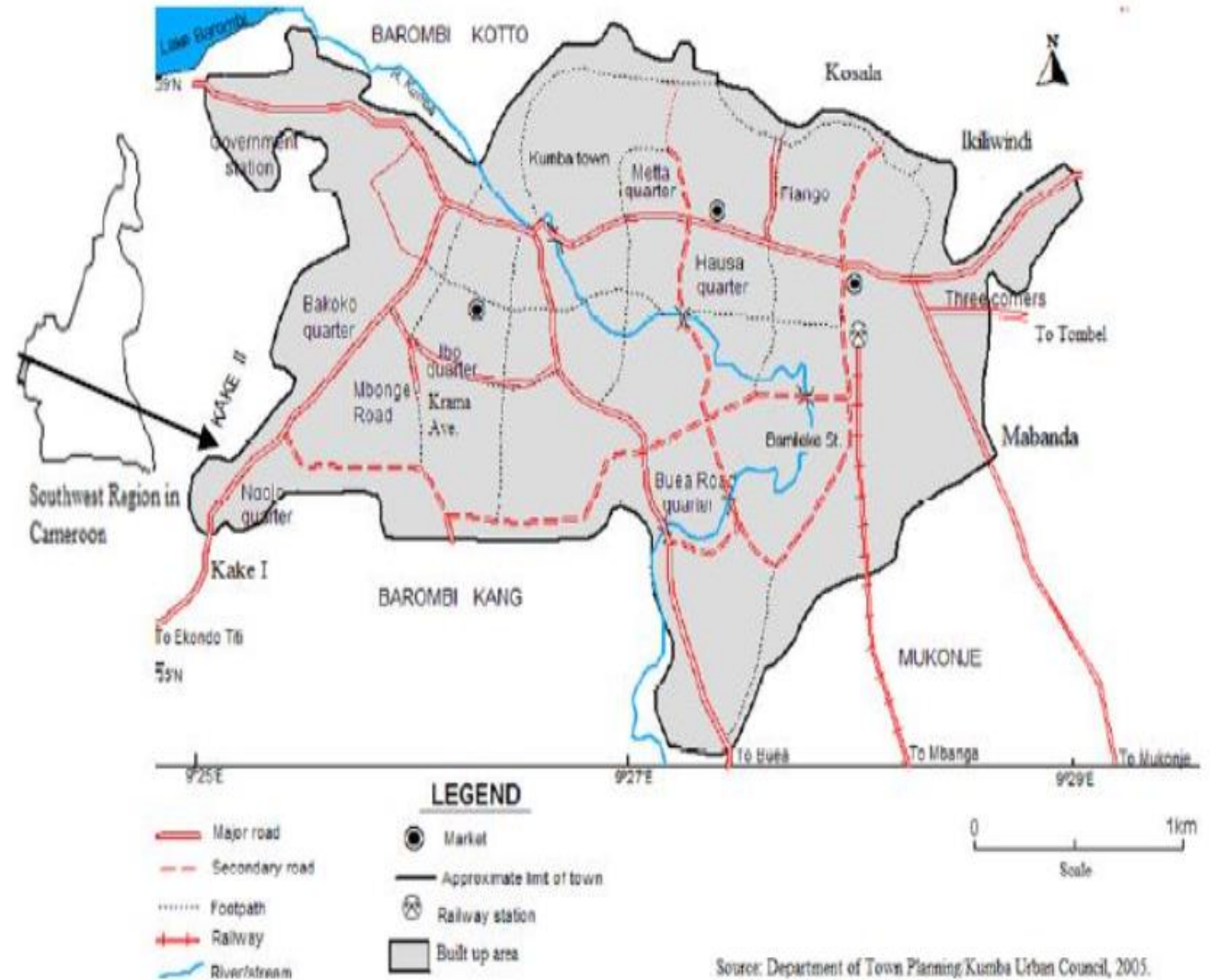
# INTRODUCTION

- ❑ Despite the fact that access to drinking water and sanitation has been recognized as a human right since 2010,
- ❑ Nearly 2.2 billion human beings still do not have access to drinking water supply services today and 4.2 billion do not have safely managed sanitation services,
- ❑ About 2.6 million people, mainly children, still die each year from diseases linked to unsafe water; In sub-Saharan Africa, the number of people using possibly contaminated water increased by 45% between 2000 and 2017,
- ❑ What makes unsafe water one of the leading causes of mortality.

# MATERIALS AND METHODS

## Study area

- Cameroon is located in Sub-Saharan Africa between West and Central Africa at the extreme North Eastern end of the Gulf of Guinea. It lies between latitudes 2° and 13° North of the equator and between longitude 8° and 16° east of the Greenwich Meridian
- It has a total surface area of 475,650 km<sup>2</sup> with a mainland surface area of 466,050 km<sup>2</sup> and a maritime surface area of 9,600 km<sup>2</sup>; respectively (NIS 2001)
- The estimated population is 27 million (WHO & UNICEF 2021)
- The rate of access to drinking water is 66% while that of sanitation is 45% (WHO & UNICEF 2021).



# MATERIALS AND METHODS

## Data collection

- **Semi-Structured Interviews** (community leaders and representatives)
- **Observation grid** (150 to households)
- **Direct field observations** (current situation of the WASH facilities in Kumba: 52 community water supply systems. Diagnose the functionality and failures of the water supply systems. Boreholes, shallow wells and gravity water system/catchments were identified and assessed during the field visits.  
Water samples (10) were collected from some widely used water points with the aim of analyzing the microbiological and physiochemical parameters in a government accredited laboratory)

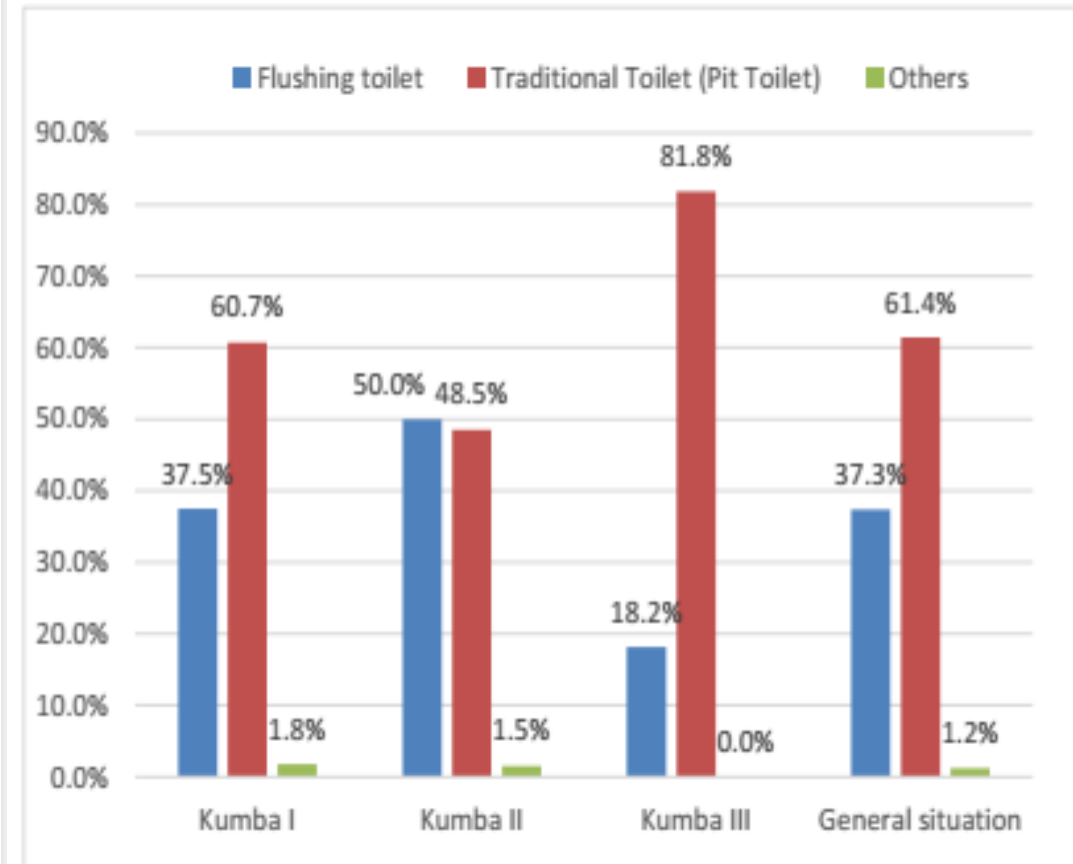
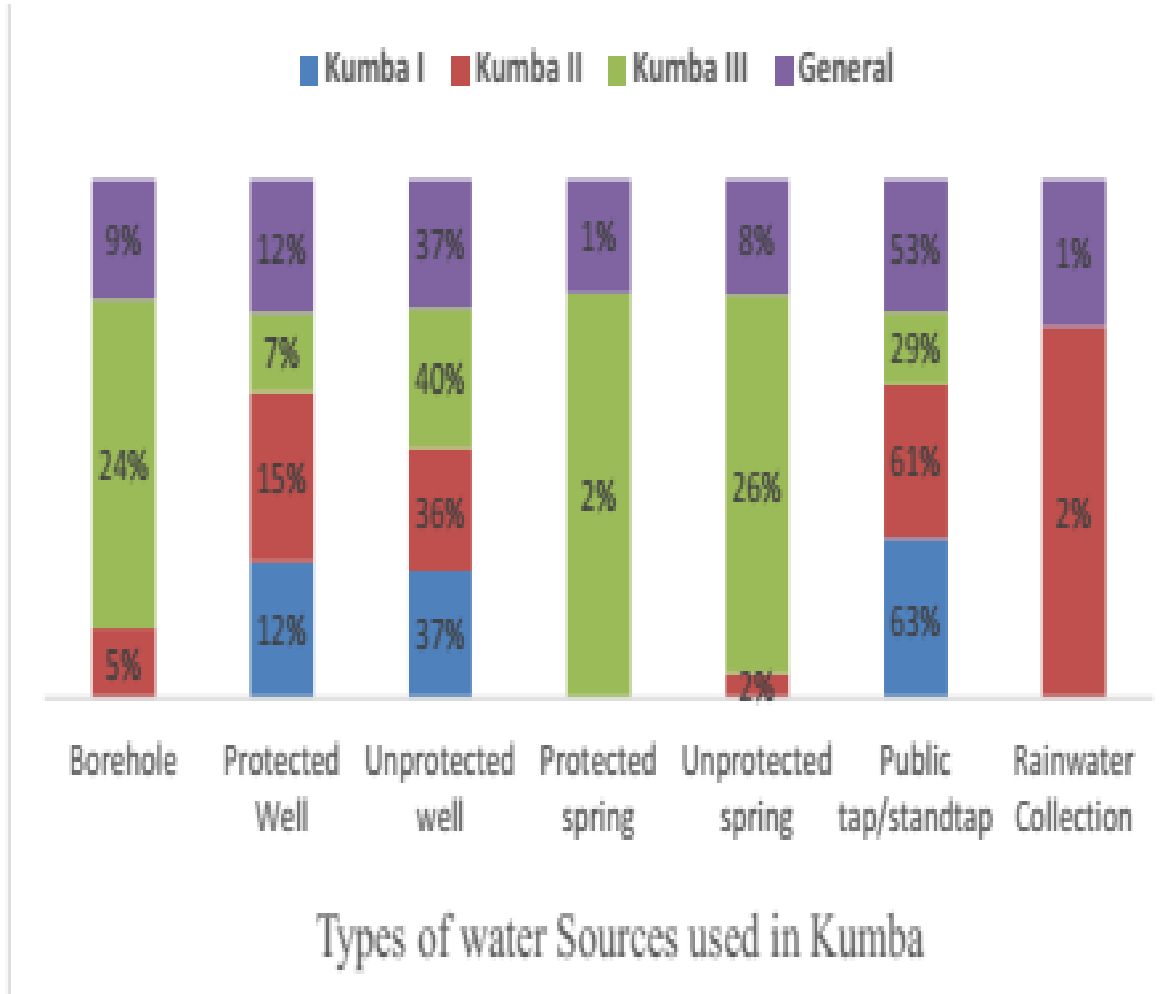
# MATERIALS AND METHODS

## Sample analysis/ Data Treatment

- ❑ The Water samples were taken to an approved laboratory (PAC Lab) and analyzed using conventional water testing tools and equipment.
- ❑ The water samples were cultured for 5 days before water quality analysis was carried out
- ❑ Physico-chemical (pH,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{HCO}_3^-$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$ , TDS, Turbidity) and microbiological (Total coliforms, E. Coli, Total bacteria, Fecal streptococcus) parameters of the water ten (10) samples.
- ❑ The data collected for the current situation of water and sanitation facilities in Kumba: KoboCollect and the exported and analysed using excel.

# RESULTS AND DISCUSSION

## Water supply, sanitation distributions in KUMBA





# RESULTS AND DISCUSSION

## Water supply, sanitation and related problems in KUMBA

- ❑ 61.4% of population currently use pit toilets while 37.3% use flushing toilets and 1.2% indicated that they use other toilet facilities
- ❑ 9% of the sampled population in Kumba indicated that they use boreholes while 12% use protected wells, 37% use unprotected wells, 01% use protected springs, 8% use unprotected springs, 53% use public taps and 1 % use rainwater.
- ❑ This is principally the case because of the scarcity of water sourced in the city of Kumba, which has made the population shy away from using water closet latrines.
- ❑ the influx of IDPs from neighbouring villages into Kumba, they mostly reside in the outskirts of the city, which happens to accommodate several IDPs and is more affordable for them.
- ❑ There is also a pipe born water network from CAMWATER which supplies all the 3 municipalities of Kumba at households and public taps even though not effective.
- ❑ When there is no supply of water from CAMWATER the population relies on the boreholes, developed wells and developed springs for their drinking water and a proportion of the population relies on eater from unprotected wells and springs for drinking probably due to irregular supply from CAMWATER or the complete absence of any piped water networks within their communities.





# RESULTS AND DISCUSSION

## Situation of water supply, sanitation and related problems in KUMBA

- Some reasons of failure of handpumps include;
  - 1- No water management committee put in place and trained to manage the water facilities,
  - 2- Poor sitting of boreholes and poor construction works,
  - 3- Poor water quality which made some boreholes to be abandoned by users, Children rough handle the handpumps by playing at the water points,
  - 4- Lack of technical skills of WMC member to conduct repairs, Unavailability of spare parts in the market,
  - 5- Lack of funds to buy spare parts,

- At community level most of the pit toilets poor conditions (some full, collapsed and exposed).
- Some households however had latrines which were in perfect shape and clean.
- Some NGOs like NRC and IRC have also constructed in reducing the rate of open defecation.
- Some of the household latrines were clean while some of them were very dirty.
- No provision for emptying
- Washing hand stations exist in front of some public latrine blocs

	Type of Structure	Characteristics	Observations
Water Supply	Boreholes	The boreholes were equipped with handpumps and submersible electric pumps	31.03% of the boreholes identified were not functional out of 29 boreholes visited.
	Shallow wells	These wells either used the bucket/handpump	14.29% of the wells were not functional out of 07 wells visited.
	Spring Sources/catchments	The spring sources were both developed and undeveloped	18.75% of springs/catchments were not functional out of 16 spring sources/catchments visited.
	Public Water Network	Some standtaps were observe not to have been functional for several years	failure at the water sources and no repairs done
Sanitation	Pit Toilets	Toilet identified were household pit latrines, VIP latrines at communal level and at hospitals	Some members of the communities indicated not having money to construct or carryout repairs on their latrines, many of them had no knowledge on dislodging of latrines when full
	Water closet latrines	These systems were identified to have septic tanks and soak away pits	100% of the systems identified were functional but some were poorly constructed. No dislodging service available in Kumba

# RESULTS AND DISCUSSION

## Troubleshooting for Pumps (India Mark II Pumps & Submersible electric Pumps) and proposed solutions in KUMBA

Location	Problem	Possible cause	Rectification
Bonakama	No water (little Resistance in Handle)	- Chain disconnected, connecting rods disconnected, - water point has never been used since after construction	- Blow-out borehole by airlift - Provide and install solar pump, water tower and stand tap
Kumba Mbeng	No water (little Resistance in Handle)	-Connecting rod disconnected -Parts of handpump all rusted	Reinstall new handpump
Nkamlikum	Electric Pump bad, population unable to pay electric bills	Motor of pump burnt, frequent low voltage	- Provide and install solar pump
Kosala 3	No water (little Resistance in Handle)	Leather cup worn out , connecting rod disconnected	Exchange old pump cylinder with new
Mambanda	Not functional - Not functional for 5 years till date - Absence of hand pump - Sitting of borehole was reported not to be proper shape	No underground pump elements	Reinstall new handpump

# RESULTS AND DISCUSSION

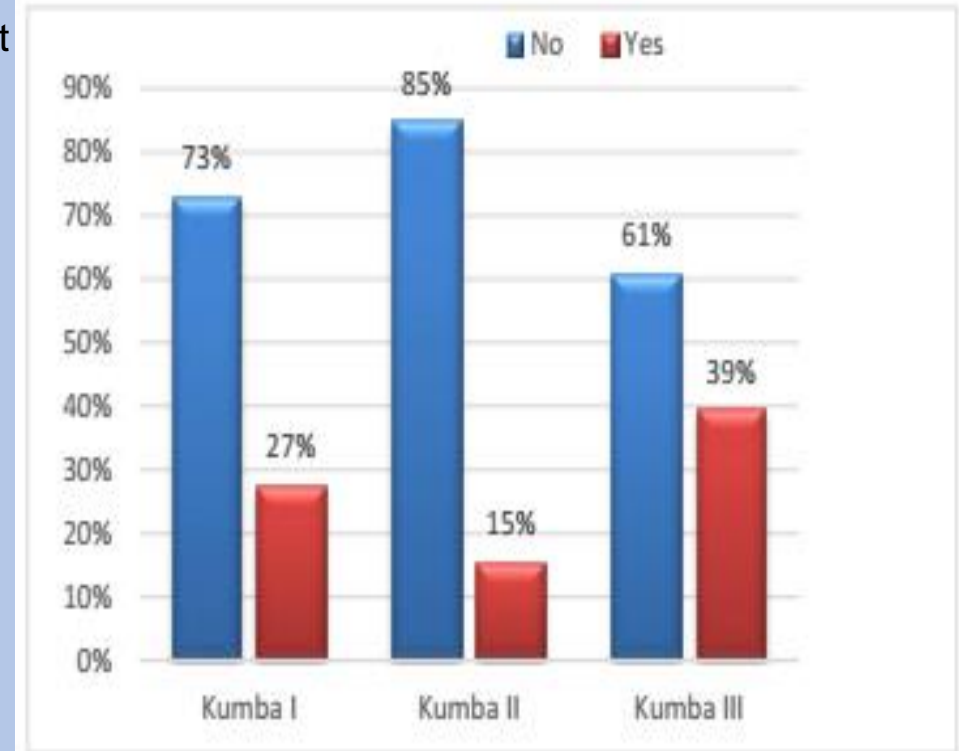
## Assessment of water quality in KUMBA

Parameters	Units	Values	Norms	Observations
pH	/	5.52±0.02	6.5 – 8.5	Does not conform. Water Point should be treated
Ca <sup>2+</sup> )	mg/l	9.17±0.02	100 max	Conform
Turbidity	NTUs	5.76±0.03	5 max	Conform
Mg <sup>2+</sup>	mg/l	5.18±0.01	100	Conform
HCO <sub>3</sub> <sup>-</sup>	mg/l	36.69±0.023	305 max	Conform
Cl <sup>-</sup>	mg/l	22.14±0.23	250 max	Conform
SO <sub>4</sub> <sup>2-</sup>	mg/l	5±1.43	205	Conform
TDS	mg/l	91.5±2.1	1000	Conform
Total coliforms	cfu/100ml	21.8±0.41	0	Does not conform. Water Point should be treated
E. Coli	cfu/100ml	9±0.33	0	Does not conform. Water Point should be treated
Fecal streptococcus	cfu/100ml	8.2±0.02	0	Does not conform. Water Point should be treated
Total bacteria	cfu/100ml	20.1±0.03	20 max	Does not conform. Water Point should be treated
Vibrio sp	cfu/100ml	5.6 ±0.04	0	Does not conform. Water Point should be treated

# RESULTS AND DISCUSSION

## Management of water infrastructures in KUMBA

- ❑ 73% of the water points in Kumba I did not have any water management committees,
- ❑ while 85% in Kumba II did not have the presence of any management committees and 61% in Kumba III also had the absence of any management committees.
- ❑ This explains the reason why most of the water points visited had major breakdowns and no major repair works were conducted in making the water points functional.
- ❑ The water points which had committees were mostly water points which were recently constructed or rehabilitated by some international humanitarian NGOs like NRC, IRC, Solidarite International.



Availability of water management committee

# RESULTS AND DISCUSSION

## Challenges Faced by Water Management Committees in Kumba

- No clear guide or legislation put in place by the state for the management of water points.
- The water management committee members do not properly understand their functions.
- Some of the water committee members are not motivated in carrying out their tasks because they are not remunerated.
- No written by-laws for the existing committee member and no working relationship between the municipal councils and the water management committees.
- Non-payment of fees by water users

# CONCLUSION AND RECOMMENDATIONS

## CONCLUSION

- Wells, boreholes, developed and undeveloped spring catchments with at least 75% being functional due to recent rehabilitation works carried out by NGOs like NRC and IRC within the city of Kumba
- Access to basic sanitation is low with just few households having up to standard latrines of the surveyed households not having latrines with another percentage of the surveyed households practicing open defecation.
- latrines constructed by the community were not well maintained and used properly. Majority of the observed latrines had some noticeable smell; some lacked superstructure, had inadequate lighting and were not gender segregated.

## RECOMMENDATIONS

- Responses on ensuring adequate water supply at household should factor provision of storage facilities, water treatment options and including construction/rehabilitation of new water sources or rehabilitation of existing water sources.
- There is need to form Water management committees to promote sustainability in the management of the WASH facilities
- Develop a water quality monitoring plan and water and sanitation infrastructures management plan in which the quality of water points will be analyzed at least twice yearly and taking into consideration the variability of climate conditions, addressing impacts and taking adaptation measures in the city of Kumba





# Thank You

**CWAS** CENTER  
FOR WATER  
AND SANITATION  
**CRDF** CEPT  
UNIVERSITY

**BILL & MELINDA**  
*GATES foundation*



**Global South Academic Conclave on WASH and Climate Linkages**