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An Assessment of the Health Implications of Poor Household Toilets on the Population in Bomaka, Buea Municipality, Fako Division, South West Cameroon.

Nkemasong Nicasius Anumveh (Corresponding Author)

Lecturer of Geography: Geography Department, Faculty of Social and Management Science, Buea University, P.O. Box 63, 00237, Buea, Cameroon

Tel: +237-677-674-158 E-mail: nkemasong 2012@gmail.com

Yinkfu Randy Nkuh

Postgraduate Student: Geography Department, Faculty of Social and Management Science, University of Buea, P.O. Box 63, 00237, Buea, Cameroon.

Mbella Fiona Mojoko

Lecturer of Geography: Geography Department, Faculty of Social and Management Science, University of Buea, P.O. Box 63, 00237, Buea, Cameroon.

Fang Amos

Assistant Lecturer of Geography: Geography Department, Faculty of Social and Management Science, University of Buea, P.O. Box 63, 00237, Buea, Cameroon.

Nformi Beatrice Malu

PhD holder and GTA: Geography Department, Faculty of Social and Management Science, University of Buea, P.O. Box 63, 00237, Buea, Cameroon.

Baba Adamu

Assistant Lecturer of Geography: Geography Department, Faculty of Social and Management Science, University of Buea, P.O. Box 63, 00237, Buea, Cameroon.

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Abstract

Household latrines remain one of the most vital aspects of housing facilities neglected in housing development in fast growing urban peripheral zones. The existence of dilapidated latrines has become the new normal in the Bomaka locality and with the associated health consequences. This study sought to investigate the implications of poor household latrines (independent variable) in the Bomaka locality on the health conditions of the inhabitants (dependent variable). The study employed the mixed research design (triangulation) combining the observational and exploratory methods with emphasis on both quantitative and qualitative techniques. Field observations, questionnaires administration, interviews and focused group discussions were the primary data sources while consultation of online and offline documents and the data bases of health facilities were secondary sources of data. The target population was all the households and their toilets stratified into three neighbourhoods following the high priority streets namely the Chief, Kawah and Miss Bright Streets. The population was stratified into classes based on their education, income and occupational status. Through the multistage sampling procedure of stratified random sampling, a total of 150 individuals were selected as respondents. Both descriptive (percentiles) and inferential (correlation analysis) statistical tool were used to process the data to establish the results. Results revealed that majority (69.5%) of the inhabitants owned household latrines with the bulk being outdoor pit toilets (79.5%) followed by external water closets (8.5%). Furthermore, most of the toilets were constructed with plank material (53.3%) with up to 20% of the toilets being open air (unconstructed). A high proportion (67.2%) of the toilets are very poorly constructed and also the man-toilet ratio is very high thereby creating much inconveniences during rush hour periods (mornings and evening). It was established that the dismal toilet facilities have induced significant health problems with the prevalence of infectious diseases dominated by intestinal diseases (56.4%) as diarrhoea, dysentery and cholera, which are suffered by 3 persons out of every 10 members of the households. Individuals do adapt to the challenges of poor latrines by defecating in nearby bushy areas and streams, and also in plastic bags for disposal later. This leads to the constant pollution of our water sources and food. This work recommends that the Bomaka locality offers many livelihood options to its population and therefore, adequate sensitisation campaigns, better toilet infrastructural development should be carried out to enhance the level of sanitation and well-being of individual in the locality. Also, regular inspection tours by council hygiene and sanitation department and support NGOs stand out as vital solutions to redress this worsening situation.

Keywords: household latrine facilities, health implications, local wellbeing, Buea

1. Introduction

Access to improved toilet facilities remains a global developmental issue to governments,

city authorities, individuals and stakeholders in housing facilities because it touches on the health of the population, community wellbeing and act as an environmental protection tool (Peprah *et al.*, 2015; Nakagiri *et al.*, 2016; Mara *et al.*, 2010; Onyeabor & Umeh, 2019). Adequate toilet facilities, alongside good hygiene and safe water are fundamental to the good health and socio-economic development of any neighbourhood. The UN (2015) recognizes access to the latrine as a universal human right, stating in its Article A/70/169 of 17 December 2015 that *"every human being has the right to have access to sanitation services that ensure privacy and dignity, and that are physically accessible and affordable, safe, hygienic, secure, socially and culturally acceptable"*. It is also a component of UN's 2030 Sustainable Development Goal 6 on water and sanitation that targets achieving increase household accessibility to sanitation in Developing Countries, which could promote the proper utilisation of sanitary facilities (Dumba *et al.*, 2008).

Globally, an estimated 1.1 billion people practise open defecation, exposing themselves and their community members to major health risks (Lantagne & Gallo, 2008). For instance, WSP (2012) revealed that over 2.1 million Kenyans use shared latrines while 5.6 million have no latrine at all and practise open defecation resulting to an annual loss of over ksh 27 billion. More than half of the 2.5 billion people without access to improved sanitation reside in low- and middle-income countries (UN, 2015). Kariuki and Magambo (2012) stated that worldwide, inaccessibility of households to toilets and other sanitation facilities are the overwhelming contributors of approximately 4 billion cases of illness annually. Water Aid (2013), unveiled that in Developing Countries, an estimated 2.2 million people, most of whom are children, die annually due to diarrhoea and typhoid linked to the frequent usage of poor and exposed toilet facilities. Adane and Mengistie (2017) noted that the rapid urbanisation in most African Countries without corresponding increase in the level of infrastructure including toilet facilities has greatly reduced the capacity of officials to provide adequate sanitation services to the fast-growing population.

Cameroon is no exception to this somewhat alarming quagmire situation of inaccessibility to household latrines. UNICEF and WHO (2015) exposed the rate of access to an improved latrine as 62% in urban areas but merely 27% in the rural. These proportions indicate that even in urbanised areas, the crisis of proper toilet facilities remains. In Bomaka, one of the fast-growing neighbourhoods of Buea Municipality, most household latrines are rapidly degrading for many reasons notably socio-economic deprivations, rapid urban growth and uncontrolled use. These have triggered the rising incidences of diseases due to water and food. It is therefore in this light that this study sets out to examine the nature of household latrines and their concomitant health implications on the inhabitants of the neighbourhoods for sustainable policy options implementation and settlement development stakeholders.

2. Statement of the Problem

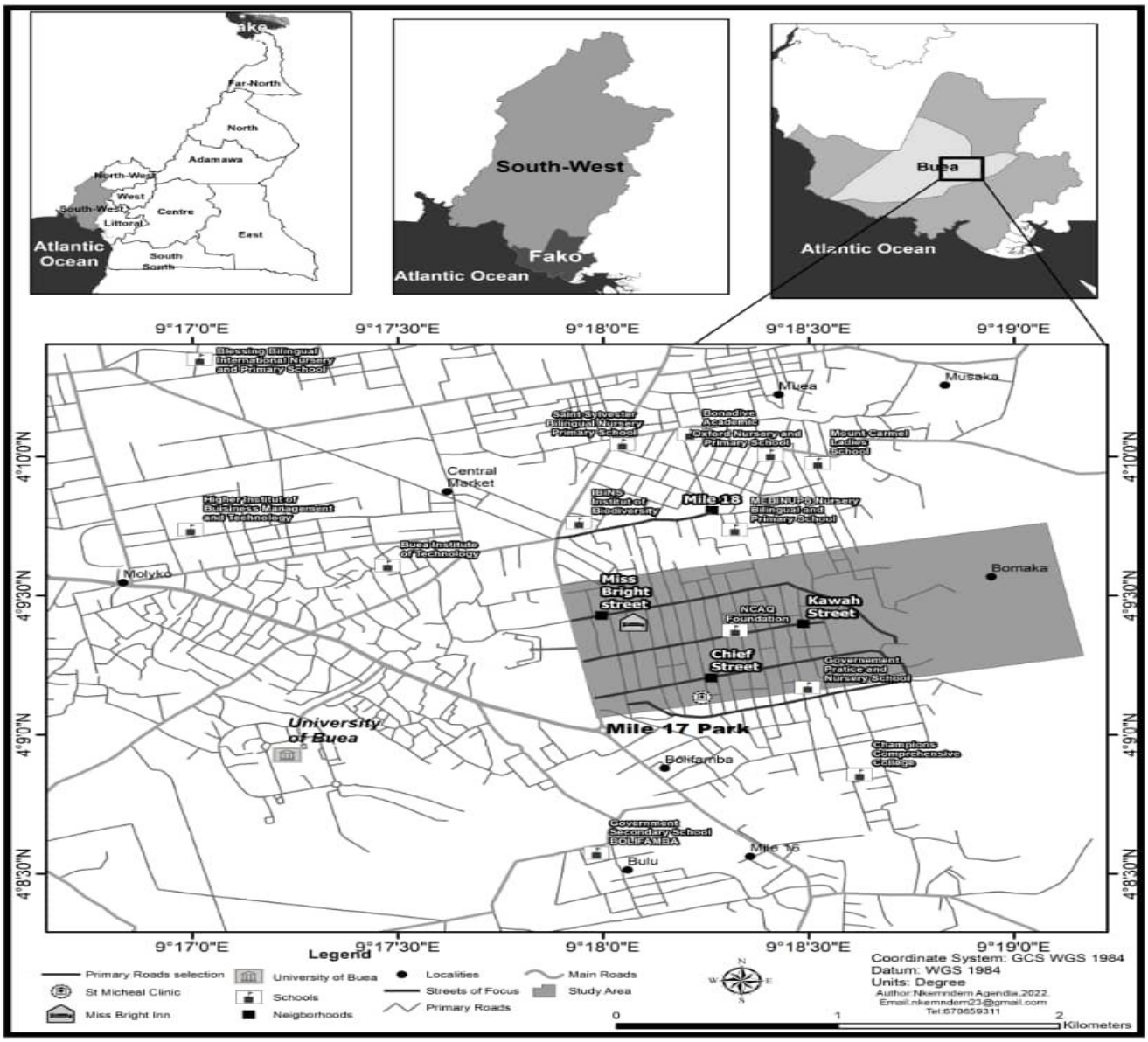
The quality of household latrines remains paramount in the respect of housing norms in any rising residential neighbourhood. In the last few decades, more emphasis has been laid on improving other basic household social services such as potable water, food preservation, and personal hygiene, to the detriment of hygiene and sanitation of the citizen notably the quality

of household latrines. The consequence has been exposure of the environment to spoliation and the population to unwanted health dangers from diseases. Bomaka has registered one of the most dramatic spontaneous growth of residences. Though a well-planned neighbourhood with a checkerboard layout, the construction of houses has been haphazard defying many urban planning and building regulations. One visible consequence is the proliferation of unconventional toilet facilities and an endemic problem of water scarcity. With this glaring housing development misnomer and the very obvious linked sanitary crisis, it is important to establish a possible correlation between the conditions of household latrines and the rising health challenges in the Bomaka neighbourhood of Buea Municipality.

3. The Study Area

Bomaka is a neighbourhood in the Buea Municipality of Fako Division, South West Region of Cameroon. It covers the land area that lies between latitudes 4º9′0″ and 4º10′30″ north of the equator and; between longitudes 9º18′0″ and 9º19′30″ east of the Greenwich Meridian, as shown Map 1. Bomaka lies to the North West of Boniamavio, North of Bowanda and North East of Bolifamba. The neighbourhood has three high priority streets- Chief Street, Kawa Street and Miss Bright Street- partitioned into 78 wards.

The study area has the equatorial mountain climate characterised by an annual average temperature of 22.3ºC and annual total rainfall of 1,992.8mm (Nkemasong, 2014). It has two distinct seasons; a nearly 8 month (March to October) long rainy season and a nearly four month (November to February) long dry season. The high rainfall amounts are indicative of potential flooding of latrine facilities if not well constructed. The relief of Bomaka is an extensive level land dissected into an upper and lower layer by mile 18 river valley. The nature of the topography is suitable for residential development. The area is covered by volcanic soils which have been a pull factor to the large population of urban poor and middle class who make up an important part of their livelihood from farming. Most of those working in the informal sector as petty traders, taxi drivers, bike riders, tailors, hairdressers, carpenters and shoe menders amongst others, reside in this area. With their meagre income sources, it is expected that their residences might also be characterised by nonconformity and inadequate toilet facilities.



Map 1: Location of Bomaka within the Buea Municipality

Source: Buea Council (2020)

4. Research Instruments and Methods

This study adopted the mixed research design involving the observational and exploratory research methods. The mixed research design was meant to address the quantitative and the qualitative questions/objectives raised at the beginning of the study. It was also used to cater for the weaknesses inherent in using only one of the designs. This Cross-sectional study considered as target population, the households in the locality especially those with poor latrines, the quarter-heads, NGOs, Local Council workers, landlords and owners/workers of some vital health facilities as clinics and pharmacies found in the area.

The research instruments considered in this study to generate primary data were structured questionnaires, interview guides and focus group discussion guides. Direct field observation

was an additional method employed to generate primary data. Consultation of online and offline libraries, magazines, databases of health facilities operating the area (Kawah and Samaritan Clinics) and post related projects were sources of secondary data of the study. The key variables of the study were latrines facilities (independent variable) and health conditions (dependent variable). The indicators of the latrine facilities considered were the location, construction materials and number of users per toilet. The indicators of health challenges were frequency of occurrence of diseases as cholera, diarrhoea and dysentery that easily result from exposure to poor toilet conditions.

The study used a multistage sampling procedure (stratified random) to select the 150 respondents of the questionnaires used in the study. To ensure spatial representativeness, the area was stratified into three main blocks following the three high priority streets- Chief Street, Kawah Street and Miss Bright Street, with each of the neighbourhoods within these streets receiving 50 questionnaires. Also, the population was divided into strata using three variables - education, occupation and income levels (Table 1).

Table 1. Socio-economic status of the respondents

Variable	Educational level	Occupational sector	Income level and status
Category	Primary School	Primary	Low class (<50.000)
	Vocational School	Secondary	Middle Class (50.000-200.000)
	Secondary School	Tertiary	
	University	quaternary	High Class >200.000
	No Schooling	Unemployed	

Source: Fieldwork (2022)

To avoid bias, the simple random sampling technique was used to select the respondents from the households living in each locality. Through the stratified random sampling technique, 20 dilapidated latrines and 20 well developed latrines were selected. Comprehensive inquiries were done within the Sample units to identify those that faced health challenges and those that did not.

Expert and eyewitness views on the issues being investigated were obtained from interviews and focus group discussions conducted with quarter heads, NGOs, local council workers, landlords and owners/workers of some vital clinics and pharmacies in the area. Fifteen persons were interviewed from each of the three study strata (the three high priority streets).

Direct field observations gave first hand evidence on the nature of latrines (number, location, conformity with norms) and their socio-environmental consequences were obtained. It is through this method that images for pictorial illustrations were gathered directly from the field.

Both descriptive and inferential statistical techniques of data analyses were used to process the data to obtain results with the Statistical Package for Social Science (SPSS) version 20 and Microsoft Excel version 2013. Qualitative data were transformed for descriptive statistical analysis by assigning codes and themes which enabled the determination of their

frequencies, percentages, mean and the variance. This provided the basis for a spatial analysis of the variables and indicators. The inferential statistical tool of Pearson's Product Moment correlation analysis (r) was used to quantitatively establish the relationship between poor latrines conditions and the health conditions of the occupants of the houses. The coefficient of determination (r^2) was then applied to the r results to establish the degree to which the characteristics of latrines explained health conditions in the area. The results obtained were made visual on figures, plates, pie-charts, histograms and tables.

Ethically, the researchers practised candid observations during field survey, implemented covid-19 and cholera preventive measures in the field. An ethical form was also collected from the Regional Delegation of Public Health in Fako Division and the responses of the respondents were kept confidential.

5. Results

Generally, preliminary field survey showed that most households have latrines but with great differences in qualities and structures. To fully address the underlying objectives of the study, many aspects were taken into consideration as indicated in the subsequent paragraphs.

5.1 Socio-Demographic Characteristics of the Respondents

The social characteristics of the respondents considered in the study were educational, and income levels, and occupational structure. The variations of these characteristics are summarised on Table 2.

Table 2. Socio-demographic characteristics of the respondents

Variable	Educational level			Occupational Sector			Income level		
	Index	Number	%	Index	Number	%	Index	Number	%
Category	Primary	5	3.3	Primary	55	36.7	Low (<50.000)	60	40
	Vocational	25	16.7	Secondary	15	10	Middle (50.000-200.000)	65	43.3
	Secondary	80	53.3	Tertiary	65	43.3			
	University	40	26.7	Quaternary	5	3.3	High (>200.000)	25	16.7
	Non-Schooling	0	0	Unemployed	10	6.7			

Source: Fieldwork (2022)

Decoding and tallying the questionnaires paradoxically revealed that 55.3% (83) of the respondents were female and male 45.7% (67). This was however explicable as most of those found in homes during the day are women. In some cases, the men, who are normally the heads of households, on getting the objective of the study elected their wives to respond saying *"it is more a feminine area of discussion"*. Information presented on the other parameters on Table 1, showed that all the respondents had some formal school but with varying degree, as 53.3% had attended secondary, 26.7% the university, 16.7% vocational schools and just 3.3% ended at primary school level. This was an indication that the respondents were well versed with the issue discussed and their responses could be

considered as valid and reliable. With respect to their occupational structure, the respondents covered all the sectors of the economy with the Tertiary (informal traders, mechanics, bike and tricycle riders, car transporters as taxi and bus drivers, hairdressers, tailors and seamstresses, NGO and community service experts) sector dominating (43.3%), followed by the primary (36.7%) sector (farmers, livestock raisers, quarry workers), secondary (10%) sector (bricklayers, carpenters) while the quaternary (6.7%) sector (teachers, doctors, researchers, and engineers) is the least. Some 6.7% of the respondents were unemployed (school dropouts, redundant workers because the crisis of COVID-19 and the socio-political crisis in English speaking Cameroon, graduates from vocational training centres still searching for their first job). The primary sector championed by farming is not dominant as expected because, Bomaka is a suburban neighbourhood and receptacle of middle-income families, mainly employed in minor service and informal sector activities escaping from high rents of the CBD zone from Molyko to Bonduma. With respects to their income levels, the bulk (43%) were middle income (50.000 to 200.000 CFA Francs) and low income (<50.000 CFA Francs) earners (40%) who can afford the cheaper land costs and low housing rents in this zone. The high-income earners (>200.000 CFA Francs) constituted just 16.7% of the respondents. The varied characteristics of the respondents made the sampled population representative of the target population.

5.2 The Situation of Latrines in the Bomaka Neighbourhood

This section examined household toilet situations in Bomaka looking at the availability, the systems, and facilities, number of users, construction material use and accessibility to water sources. Access to household toilets is a necessity and a human right for all human beings including those in Bomaka.

5.2.1 Possession and Systems of Household Latrines

Field investigations revealed that of the 150 households sampled a majority (69.5%) of them owned a household latrine of some sort while 30.5% did not own household latrines at all. It becomes clear that at this moment in the 21st Century, integration of toilet facilities as house construction norm is not yet viewed as mandatory in the minds of a significant proportion of the population in the Bomaka locality. A detailed analysis revealed that all high- and middle-income earners had a toilet of one category or another. All those who had no toilet at all were low-income earners, and mainly those who have had only primary and vocational education. In this category males were more (21%) than females (9.5%), since the males were found to be unemployed household heads or rummaging a livelihood from unreliable informal sector occupations. Furthermore, field observations exposed three categories of toilets in Bomaka (Plate 1).

Plate 1: Types of Household toilets

A= Internal Water Closet toilets, B= External Water closet toilet, C=Pit latrines, D= Ventilated Pit latrine

Source: Field work (2022)

The possession of these toilets varied within the population as shown on Figure 1.

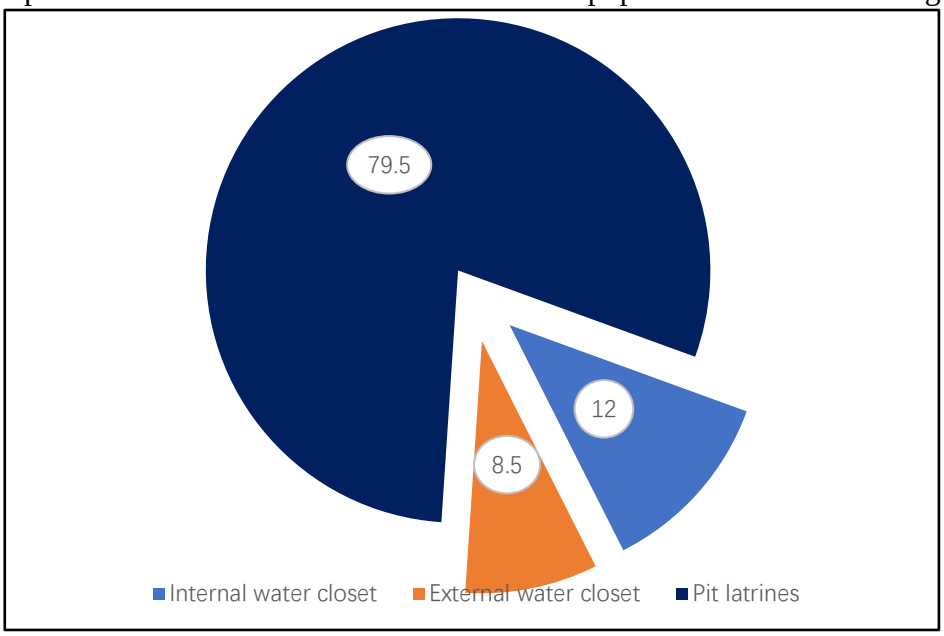


Figure 1. Household Latrine Systems in Bomaka

Field survey (2022)

Some of the households (20.5%) had water closet toilets either located within the house (internal-8.5%) as in B or out of the house (external-12%) as in A. These water closets are popularly referred to as "flush latrines" amongst the population. The majority (79.5%) of inhabitants have the external pit toilets (C) commonly known as the unflushed latrines.

These results reveal that the majority (88%) of the latrines used by households in Bomaka were mostly external toilet systems while only 12% of the respondents used internal toilet systems. It was established that all the high-class respondents had the internal water closets and most often combine them with eternal water closet toilets. Some of the middle class have the internal water closets and pit latrines, while others have just the external water closets. The poor who have toilets have the open pit latrines, with some now improving them to ventilated pit toilet systems. With regards to usage of the different types of toilet facilities, 49% of the respondents used ventilated pit toilet systems followed by 30% who used open pit system while just 21% used flushing toilet system. Most households with internal flushing toilets still end up using pit toilet system due to water scarcity.

Most of the vulnerable population that do not have conventional toilets often resort to using plastic papers to excrete and randomly dispose them around. Some directly defecate into nearby streams and bushes, some visit neighbours just to stool, while others manage the deplorable toilets in their compounds. Interviews however revealed that the use of streams and bushes as toilets has sharply declined because population explosion in Bomaka most bushes around homes and the nearby streams have been cleared off and so are very exposed. In the analysis that follows, emphasis is placed on latrines because they are the most common types of toilets and if poorly managed, their consequences on humans and the environment are enormous.

5.2.2 Conditions of Household Latrines

Investigations into this indicator focused on *parameters as construction materials, the roofing situation,* general state *and the number of rooms per toilet* in Bomaka. Figure 2 reveals that the toilets were constructed with the use of varied materials.

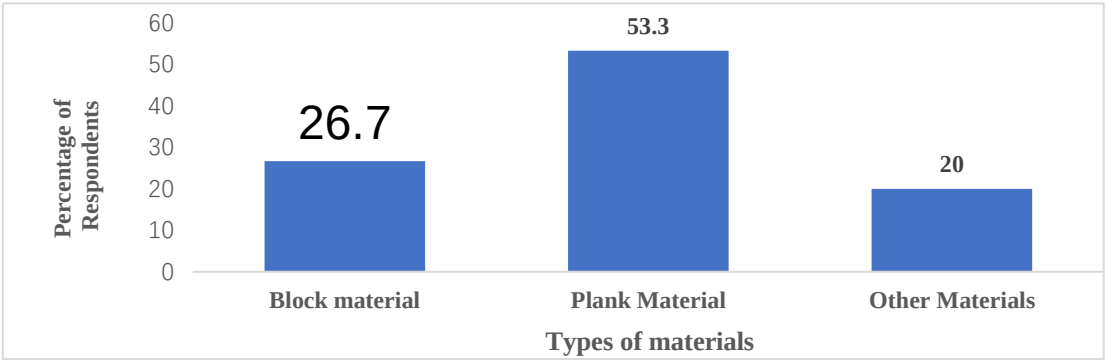


Figure 2. Construction materials for Household latrine in the Bomaka Locality

Field Survey (2022)

Figure 2, reveals that, 53.3% of the household toilets were built of plank materials, 26.7% of

cement block materials while 20% of the latrines were just opened spaces caged with all other sorts of materials ranging from plastic through old zinc to banana leaves and palm fronds which just partially shaded the occupants from complete view by passers-by. Images of latrines constructed out of various materials are illustrated on Plate 2.

Latrines constructed out of cement bricks

Latrines constructed out of plank materials **Latrines built with makeshift materials**

Plate 2: Building materials used for toilet construction

Source: Fieldwork, 2022

It was established that well-constructed latrines were found more in the compounds of the middle-class residents and some educated low class inhabitants of the area. The largely unconstructed latrines were found in the abodes of the poorest of the poor in Bomaka. It was a very rare phenomenon to find open latrines of any sort in high class residences.

On roofing characteristics, it was observed that a very large majority (86.4%) of the toilets of the household latrines were unroofed, while just 13.6% were roofed. Since the dominant form of toilets were latrines, a further analysis was done on the general state of this toilet type. Findings revealed that most of the latrines in Bomaka are in poor state. Figure 3 gives more information on the state of latrines.

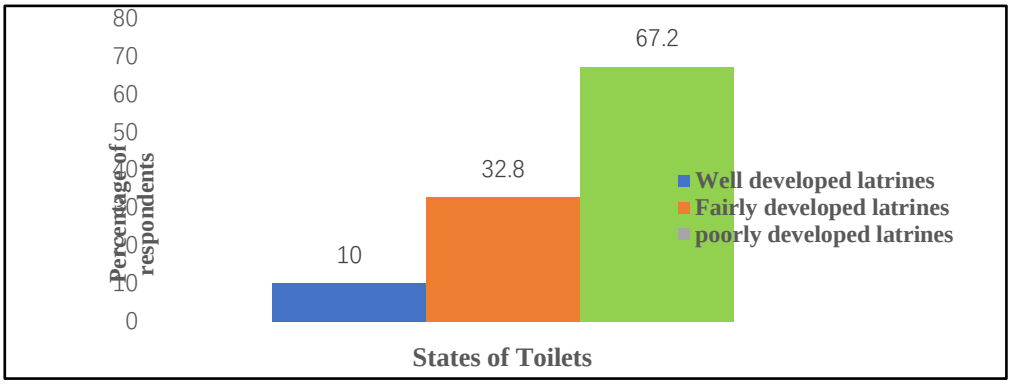


Figure 3. States of latrines in Bomaka

Source: Field investigation (2022)

From Figure 3, it is established that 67.2% of the household latrines in Bomaka are totally in poor states, 32.2% are fairly developed and maintained while just 10% are well developed and properly maintained. It is important to highlight that many latrines in the Bomaka area are in an advanced state of dilapidation. Plate 3 illustrates these latrines based on their general state.

A) State or conditions of latrines

(i) Well constructed **(ii) Fairly well constructed** **(iii) Poorly constructed**

B) **Some dilapidated unroofed latrines which are common phenomenon in the locality.**

Plates 3: Evidence of dilapidated external and internal characteristics of latrines in Bomaka

Source: Fieldwork (2022)

Furthermore, in most cases they are constructed with very precarious materials as plastic paper, partially decayed zinc and leaves and most toilet roofs leak profusely, making useless the roof over them. Also, toilets with conventional shutters are more of an exception than the norm in the poor neighbourhoods. Some of the toilets have makeshift floors made of gravel, stones or wood and walls of old metal sheets fertilizer bags and clothes. This poor state of the toilets has resulted in limited privacy, poor ventilation, air pollution and general poor environment quality.

Class disparity was also observed on this aspect of toilets. The poor who are the owners of the most rudimentary houses, had these toilets, while the middle class and high-class respondents did not have these within their compounds.

The number of rooms per latrine in each household, was conducted so as to compare and evaluate how comfortable dwellers were with the available latrines within their households. The results obtained are summarised on Figure 4.

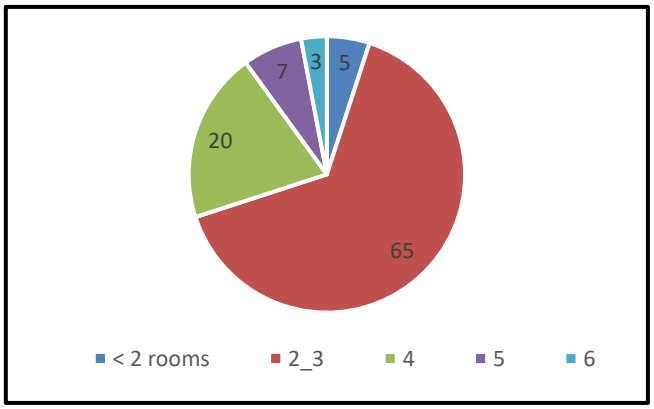


Figure 4. Number of rooms per latrine in Bomaka

Fieldwork (2022)

Figure 4 reveals that 65% of the latrines contained 2-3 rooms, 20% had 4 rooms, 7% had 5 rooms, 5% has less than 2 rooms and 3% of the toilets had 6 rooms. This reality was not uniform amongst the respondents. The high-class respondents (high income earners, highly schooled and those working in the high-profile tertiary and quaternary sector jobs) had more toilet rooms (on the average above 4 toilet rooms) relative to the sleeping rooms. Each bedroom had an associated toilet with extra toilets attached to the living and VIP living rooms. In addition, most of them had external toilets for use when they host events. The middle-class respondents strived to equate their number of bedrooms with toilet rooms. They therefore constituted the bulk of respondents having 4 toilet rooms. The low class (low-income earners, lowly schooled, and workers of informal sector and other menial jobs) had very low toilet room to bedroom ratio. Most have a general pit toilet with 2 to rooms, serving the entire household and/or the collection of households in the compound. In some extreme cases, toilets with few rooms serving adjoining compounds were spotted in the field. This justified the findings that 69.9% of households sampled shared toilet facilities. From this, 63.8% shared toilets with 3 to 4 households, 23.8% shared with 1 to2 households while 12.4% shared toilets with 5 households and above.

The person-toilet ratio was used to assess the degree to respondents in each household were contented with the available latrines. Surveys revealed that most of the households had many rooms indicative of many tenants as shown Figure 5.

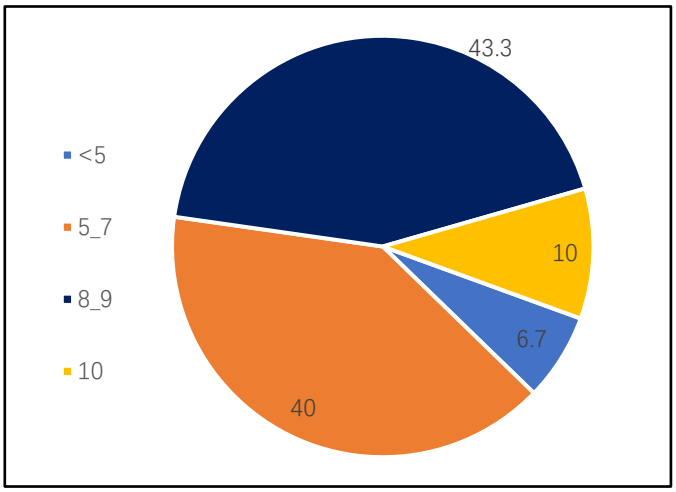


Figure 5. Number of persons per household in the Bomaka Municipality

Source: Fieldwork (2022)

Figure 5 reveals, 43.3% of the compounds harboured 8 to 9 persons, 40% had 5 to 7 persons, 10% had 10 persons and above, while 6.7% accommodated below 5 persons. Paradoxically, the sizes as well as the depths of most toilets were limited and these often create inconveniences during rush hours (Morning and evening). An inverse relationship therefore was established between household size and level of income and education. Households with more than 5 persons per room were associated with low-income earners, and low education levels (primary and vocational) as well as those working in the primary (farmers and quarry workers), secondary (carpenters and bricklayers) and tertiary (petty traders) sectors who had precarious toilet conditions. The smaller number of people living below 5 persons in a room were mostly households of high-income earner, above secondary education level and those working in the tertiary, quaternary and part of those in the secondary sector who had the best toilet conditions. When this information is matched with that on Figure 4, it is evident that overcrowding at toilet facilities will be very visible during rush hours notably mornings. Statements obtained from the interviews of residents confirmed this as they said *"the available latrines are never adequate for them… most of their landlords get into contracts with neighbours who lack latrines for their tenants to jointly use latrines with them and thus, escalating the issues of inaccessibility as well as conveniences"*.

In this situation where, toilets are mostly open pit latrine facilities, water availability becomes very crucial in maintaining personal and environmental hygiene. The impacts of water scarcity varied amongst the population. It is important to emphasise that field investigations revealed that only 10% of the households sampled had regular access to potable water. So, approximately 90% of these household have no permanent sources of water close to them. This was suggested by inhabitants and experts involved in the focused group discussions as they held that "*due to the poor nature of these household latrines, water is essential for the household dwellers to always use before and after visiting these latrines"*.

This motivated an investigation into the availability of water to these households. Results from the study revealed that a majority (70.3%) of households use piped water connected in

their compounds which is shared amongst everyone in the compound. This is followed by 29.7% of respondents who use public taps and 19.9% use their private in-house tap connection. A majority (79.4%) of households revealed that pipe borne water supply was very erratic while just few neighbourhoods had constant water supply. The inaccessibility and unreliability of piped water supply has turned households to alternative such as wells (43.6%), boreholes (36.3), rainwater harvesting (27.7%) and spring (20.4%).

This impact was less severe amongst the high class and middle-class households' respondents because they have invested heavily in storage facilities like buckets, pots, jugs, drums and underground reservoirs especially during the rainy season when the abundant rain water is harvested and stored. Furthermore, as most of them have vehicles, they fetch water from the University of Buea, GRA Buea and other areas with constant flow of water during working hours. They also could do mass storage of water as they ferry home great volumes of water from nearby streams. With the reducing cost of drilling bore holes, more are turning to boreholes as independent water sources. The positive impacts of the rise of boreholes in alleviating water stress are visible as the households with newly developed boreholes often sell water to individuals at least 4 times in a week. Some even give out free water during the morning and evening periods when the boreholes water yield is at peak. The respondents that were tenants to the high-class households were privileged as, despite limited pipe-borne water supply, the compounds harboured boreholes and wells from which they fetched water to flush and do other household chores.

The poor households that do not inhabit areas close to these benevolent borehole owners suffered the brunt effects of the water scarcity. To mitigate the situation, they are bound to turn to off-compound water sources which are located at varied distances from their abodes. Enquiries made into the distances covered by households to get water revealed the information presented on Figure 6.

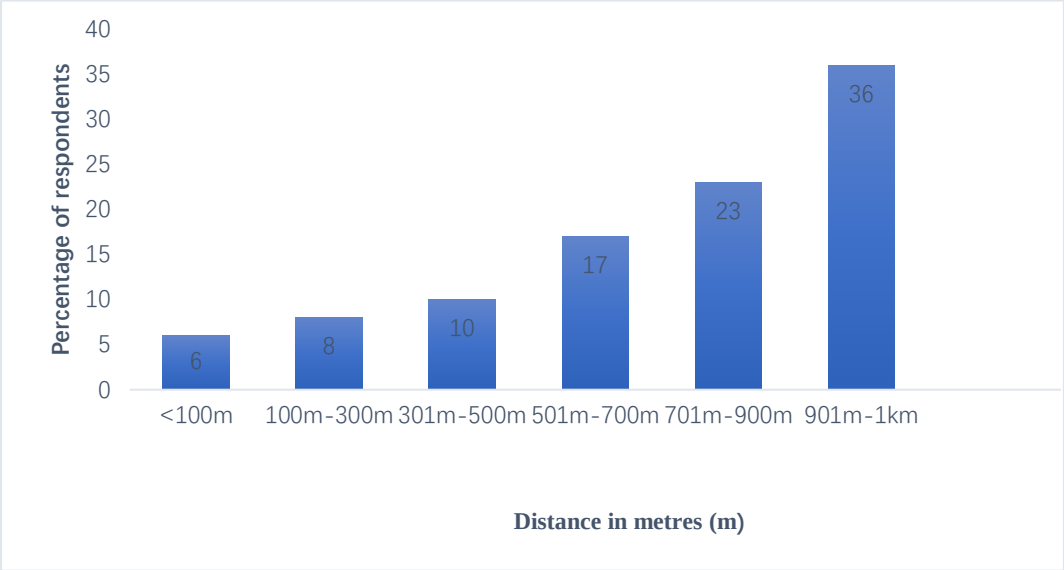


Figure 6. Distance covered by households to access water sources in the Bomaka locality.

Field Survey (2022)

According to the survey, majority (36%) of the households covered a distance above 900m (901m to above 1 km) to access water sources, while 23% covered between 701m and 900m to. Few (14%) of the households covered less than 300m to access potable water sources. The desperate landlords and tenants of the 84% of respondent households without water connections, trekked more than 100 m to fetch water while just 6% fetched water within 100 m of their homes. This very arduous exercise mostly performed by women and children does not guarantee storage of great volumes of water to meet up with all household demands. Facts from analyses showed that the quantity of water available to poor households is often just enough for kitchen uses and not for the latrines. Consequently, such homes if at all they have water closets toilets, water rationing may coerce habitants to allow toilets unflushed in a desperate attempt to conserve the limited precious liquid which is just enough for kitchen use. The preceding analyses gives clarity on how vulnerable households are to latrines facilities in Bomaka.

6. Health Implications of Poor Latrines

Poor or inaccessible household latrines in Bomaka have induced severe health implications on the inhabitants. Due to air pollution, poor environmental quality and water degradation and contamination, water related and none water related diseases have soared affecting the health of the population. Survey revealed that the following on Figure 7 as some of the most frequently occurring non-water related pestilence emanating from poor household latrines.

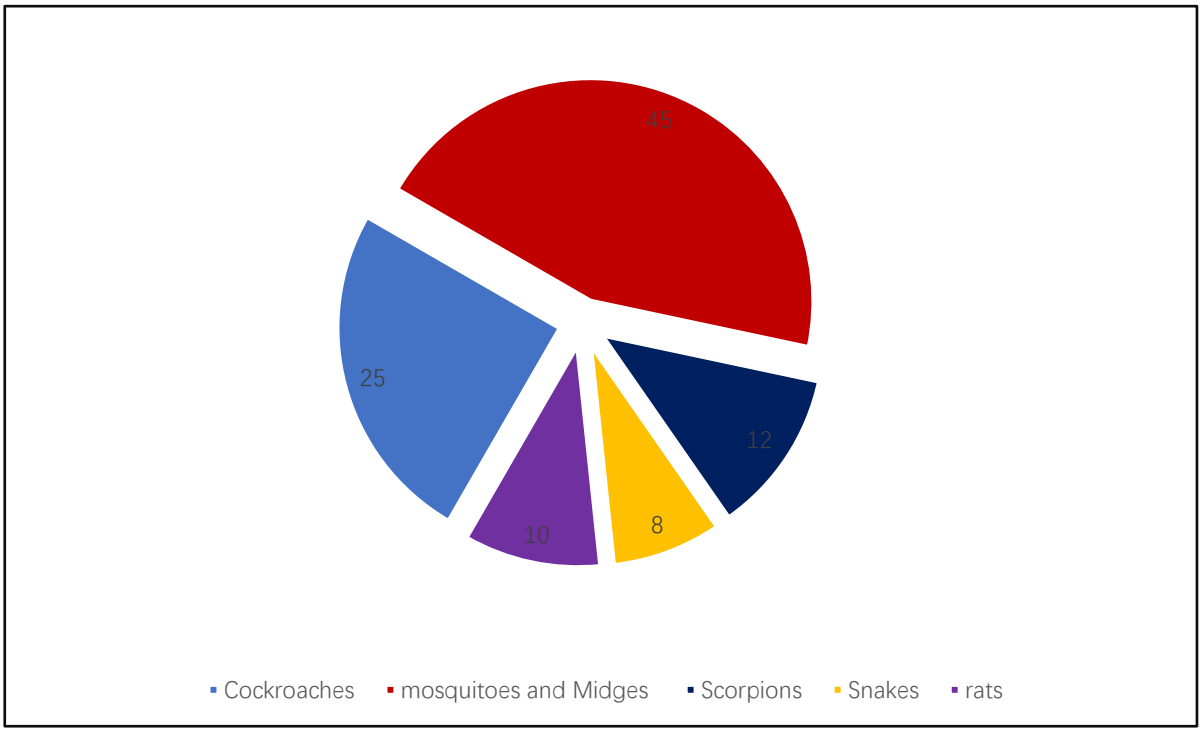


Figure 7. Existing pests and disease vectors around latrine areas

Source: Fieldwork (2022)

It is concluded from the Figure that pests and harmful organisms like cockroaches, scorpions, mosquitoes, and snakes as well as disease vectors as mosquitoes have become very present around these poor and unhygienic latrine environments. Although some residents said that some of the parasites are not physically harmful, they easily contaminate unprotected food.

Figure 7, highlights mosquitoes and midges (45%) as the most common vector around compounds with poor state of toilets, followed by cockroaches (25%), scorpion (12%), rats (10%) and least common snakes (8%). Since the poor and least schooled respondents, had the highly dilapidated households' toilets, (Plate 2), these pests are more common place within their neighbourhoods. This is because of the limited amount of water availability, poor sanitation, and the poor conditions of the toilets that usually create favourable breeding and proliferation grounds for them.

In addition to these poor latrines being the nurseries of the above disease vectors, the inadequacy of these toilets has induced a sanitary disaster as majority of the people not having proper toilets in their compounds oftentimes defecate in nearby bushes as well as in plastic papers and dispose them randomly particularly in the lone stream crisscrossing the area. Some ugly scenarios of flies puzzling over open air defecations and sewage on latrine floors are illustrated on Plate 4.

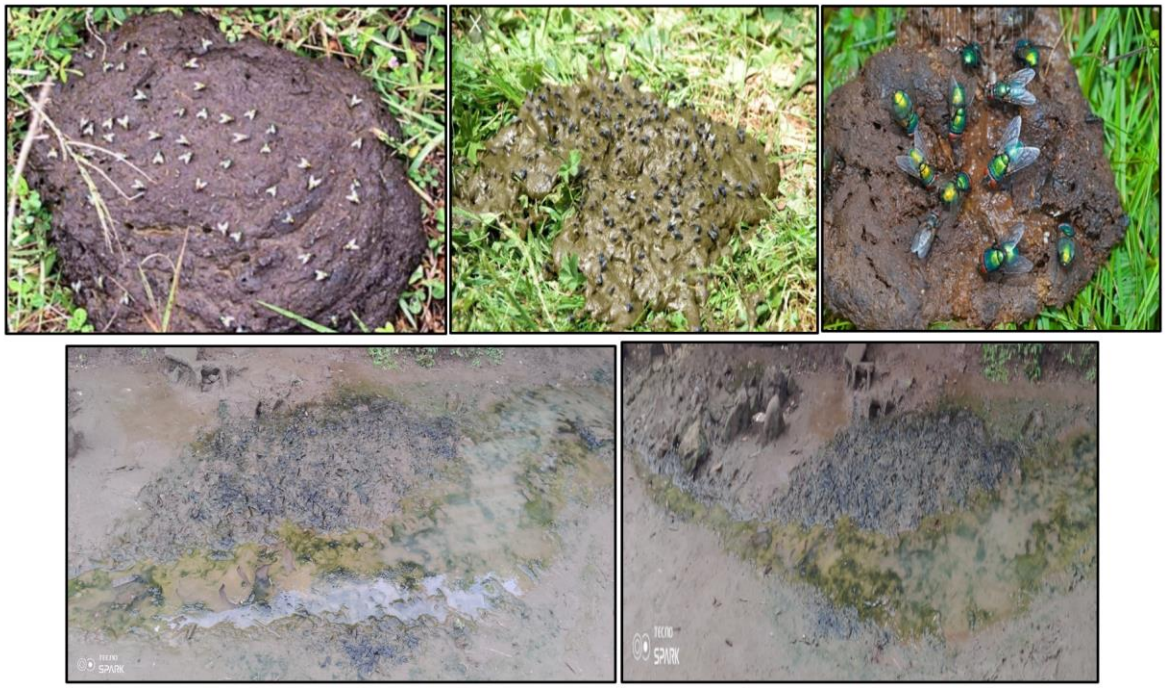


Plate 4: Messy situations of poorly disposed faeces and overfilled pit latrines

Source: Filed Work, 2022

Unfortunate scenarios of toilets located very close to kitchen facilities as shown on Plate 5 were common place in many poor neighbourhoods of Bomaka.

Plate 5: Vulnerability of some poor domestic kitchens located very close deteriorating latrines

Source: Fieldwork (2022)

This toilet in an advanced state of deterioration is located at just 3 m from the kitchen. Such inappropriate locations of facilities have been induced by very small plot sizes which puts the poor households at a construction dilemma. They cannot afford internal household facilities of toilets and kitchens yet the land size is too small to permit the appropriate distancing between these conflicting compound facilities. These toilet conditions will normally create enabling conditions for health problems as pungent smells and most of the cooked and exposed food could easily get contaminated by vectors as flies. These situations have provoked loss of appetite and the spread of contagious diseases. This is evidence of the vulnerability of some domestic activities to the challenges nearby deplorable household latrines.

Since there are no strict movement barriers to these organisms, it was observed that areas of the rich and middle status families bordering these havens of the poor were suffering periodic swamping by these pests and vectors. Thus, though the poor areas are source points, their nuisance effects even have the wealthy areas as destinations. This is especially during periods of electricity failure when boreholes cannot not be powered.

The survey corroborated by data from the daily records of some major clinics and health centres operating in the area as the Kawa and Good Samaritan Medical Centres revealed the most frequently occurring infections are dermatological, viral and intestinal as shown on Figure 7.

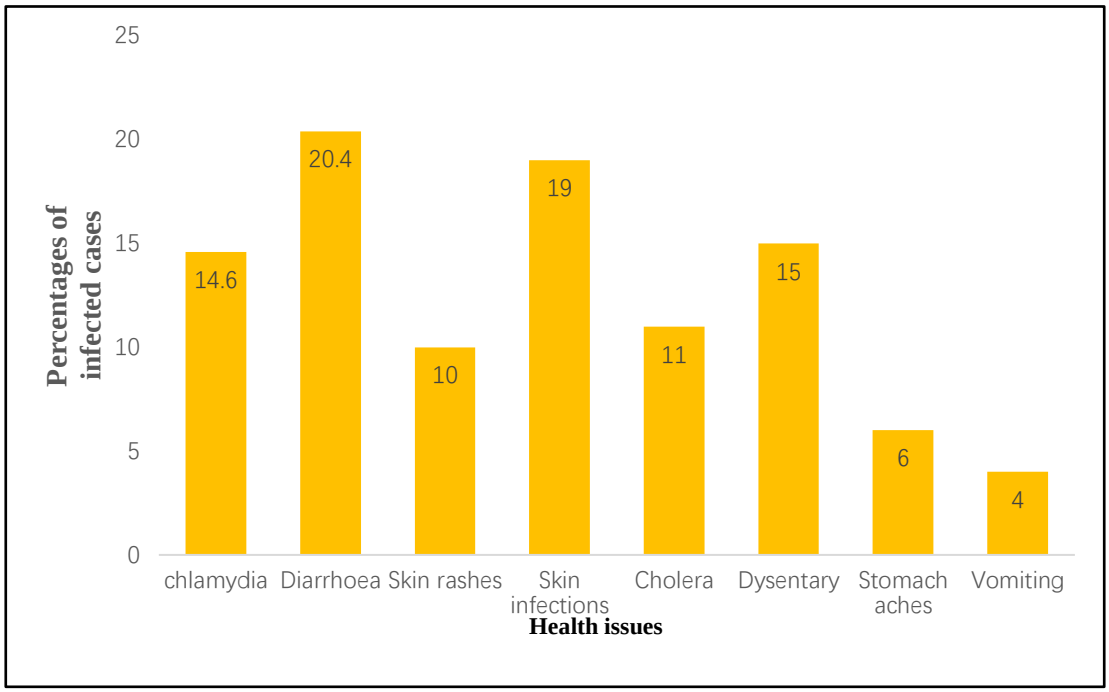


Figure 7. Diseases caused by the use of poor latrines

Source: Fieldwork (2022)

In respect to the information presented on Figure 8, collectively, intestinal diseases are the dominant (56.4%) diseases caused by poor latrines (20.4% of cases were diarrhoea, 15% were dysentery, 11% cholera and other related ones as 6% stomach bites, loss of appetite and vomiting-4%), followed by the class of skin diseases (29%) notably general skin infections (19%) and skin rashes (10%). The main venereal disease noted was chlamydia (14.6%). The dominance of intestinal infections is expected.

These health implications are felt more by the low-class residents who are both poor and lowly educated. They lack the financial potentials to disinfect their latrines and compounds regularly so as to chase away the pests and disease vectors. Mosquito nets and prophylactic malaria treatment and deworming they cannot afford. Furthermore, they suffer much from water shortages and lack basic water purification materials, their rudimentary education deprives them of public hygiene skills. It is no surprise that they constituted the bulk of the recorded cases suffering from these poor latrine related diseases. It was however noted that some of these diseases are not from direct usage of latrines but through food contamination by some parasites. This is because these illnesses are linked to water and food contamination which frequently occur when toilet facilities are exposed, unhygienic and inappropriately located near domestic facilities like kitchens as that shown on Plate 5.

A Correlation analysis between poor latrines and health challenges using Pearson's Product Moment Correlation Test established a statistically significant relationship between the spread of diseases and the existence of poor latrines, with a value of 0.001. The details of test analysis are presented on Table 2.

Table 2. Correlation Analysis

	Correlations	Nature of the latrines
Nature of the latrines	Pearson Correlation	1
	Sig. (2-tailed)	
	Sum of Squares and Cross-products	10.000
	Covariance	.256
	n	40
Health challenges	Pearson Correlation	.500**
	Sig. (2-tailed)	.001
	Sum of Squares and Cross-products	5.000
	Covariance	.128
	n	40

***. Correlation is significant at the 0.01 level (2-tailed).*

Source: SPSS Analysis (2022)

The Pearson's Product Moment correlation value of 0.500 was statistically significant with a value of 0.001 at a level of 0.01 significant. That is, r (0.001) =0.01, r=0.005. The positive value of the correlation analysis between nature of latrine and health implications indicates a direct relationship between poor latrines and the development of health diseases. This implies that, the more household dwellers are exposed to poorly developed and contaminated household latrines, the more they faced health challenges such as diarrhoea, dysentery and rashes. The coefficient of determination (r^2) of this result of 0.25, implied that poorly located toilets as an independent variable provides 25% explanation to the occurrence of these recorded diseases (dependent variable). Therefore, whatever the improvement measures implemented on latrine conditions, will significantly impact on the liveability of the Bomaka neighbourhood and its inhabitants.

7. Indigenous Adaptation Measures to the challenges of Poor Household Latrines

Investigations on the indigenous adaptation measures to the challenges of poor latrines and/or non-existence of latrine facilities revealed that most of the vulnerable population often use plastic papers to excrete and randomly dispose around. Some directly defecate into nearby streams and bushes, others visit neighbours just to stool, some use their job side latrines, while some manage the deplorable ones in their household. These adaptive strategies are the cause of the numerous health effects that these communities are going through in recent times. It is important to also highlight that the challenges of poor latrines have provoked involuntary migration of some households to unknown localities that are unfriendly and insecure.

8. Discussions

Findings unveiled that household latrines are not evenly distributed in Bomaka, let alone the fitness and the structures of the latrines. Most are constructed with plank as well as block materials but many are not completed and have depreciated with time and especially roofs and floors. The disparity in the distribution of latrines as well as the poor-quality of their nature confirms the study of the UNICEF and WHO (2015) which noted that in Cameroon

the rate of access to an improved latrine was 62% and 27% respectively in urban and rural areas.

Most of the household latrines are located close to the kitchen where domestic activities usually take place. These latrines do not contain enough detergents as well as water. Because of these, they are never not properly catered for since the available water is usually sufficient only for the kitchen and other domestic uses. These have made most households vulnerable to food contamination. These findings are consistence with that of Owusu (2010) who confirmed in his scientific paper that the cause of the deplorable conditions of some latrines was due to the lack of detergents and other sanitary substances such as water to keep them clean.

Due to the poor and unsanitary nature of most household latrines, there has been a steady spreading of toilet related infectious diseases most prevalent of which are cholera, dysentery, syphilis, chlamydia, rashes amongst other. The loss of appetite, stunning smells and vomiting are the major characteristics of human health of such households. Furthermore, such latrines form comfortable niches for harmful organisms and vectors as scorpions, centipedes, snakes, midges and mosquitoes which regularly invade sleeping and dining rooms especially during night hours, thus making the environment unsafe especially for children and the aged persons. The WSP (2012) has constantly made mentioned of the health challenges of poor latrines in most African cities such as typhoid, dysentery and infectious diseases in its publication.

Findings also revealed that most victims and vulnerable individuals of households with no and/or poor toilet facilities frequently use nearby bushes, streams and plastic papers to defecate. These faeces are often randomly disposed into nearby surroundings. The result on the use of bushes is consistence with the study of Nbendah *et al.*, (2020) who noted that about 7.98% of individuals in the Far North still practise open defecations.

9. Conclusion and Policy Implications

With reference to the enormous urban development potentials endowed in Bomaka, there has been a consistence influx of population into the area. This galloping population demands houses with good facilities notably toilets to stay comfortable and safe within the environment. Furthermore, in consideration of the fact that improvement of housing facilities remains the major aspect on the Sustainable Development Goals, household toilets must be given an undivided attention since they constitute a major aspect of housing. However, improving personal hygiene, food preservation and nutrition without taking into consideration the state of the latrines will not foster any improvement in sanitation as well as the wellbeing of the population.

It is thus, recommended that the local councils should take into consideration the aspect of latrines when issuing building permits. The hygiene and sanitation services of the councils should reintroduce the regular inspection of toilets in the area and other localities. Also, landlords should always create enough space for toilet facilities during construction and the structures should correlate positively with the number of persons in the household. The government, NGOs and the local councils should provide public toilets in clustered areas as

well. The role of NGOs and other civil society organisations is crucial since it has been established that the extension of operations by some NGOs into the communities has led to the development and improvement of some dilapidated household latrines in the area. Since these urban poor need but *"bread and not cakes"* their lot can be significantly ameliorated by providing them with improved latrine facilities these as shown on Plate 6.

Plate 6: Improved pit latrines

Source: Carted from Reviewed Literature

The advantages ingrained in these latrines are that they are cheap to build, are well ventilated, constructed out of cheap but durable materials, have many rooms and so can fit into high tenant density compounds. Furthermore, they are of varied sizes and so can be built in compounds with much space as well as limited space. If this is done, the vast majority of the poor people living in Bomaka will become wealthy as the adage holds that "health is wealth".

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