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## Environment, Subsistence and Cholera in Douala, Cameroon

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### **Abstract:**

*Cholera has been an acute disease with millions of recorded deaths in today's developed countries but still remains a threat in developing countries today with poor hygiene and sanitation facilities aggravated by the socioeconomic amongst a large portion of the population. "ENVIRONMENT, SUBSISTENCE AND CHOLERA IN DOUALA" seeks to explore the notion of sanitation and cholera as illness in Negro-African sociocultural which is often centred at the level of manifestation of ill health called illness when it becomes sickness once the whole society is involved as AuthurKleinman. Qualitative method with in-depth interviews and focus group discussions were used. The interpretation of absence of health be it illness or sickness is often linked to the system of norms and values as well as the belief system. Although modern education does vulgarise the biomedical conceptualisation of disease, it falls short of reversing the merging of beliefs and biomedical models. The populations do not neglect absence of hygiene and sanitation for instance but still interpret symptoms within culture. This explains why knowledge on cholera aetiology may not be sufficient in its combat because of basic personalities and prevailing socioeconomic situation and space management.*

**Keywords:** Cholera, environnement, population, hygiene, sanitation

### **1. Context and Literature**

The causative agent of cholera is bacteria called *Vibrio cholera*. It causes a diarrheal disease with epidemic and pandemic potentials. The aforementioned is an enteric disease characterized by profuse watery diarrhea and vomiting which lead to dehydration, electrolytes loss and eventual hypovolemic shock as well as renal failure. If no urgent medical attention is given, death can occur within hours in 30 to 40 % of cases (Sack DA, et al. 2004). Cholera is a public health concern especially in less developed countries having poor hygiene, rudimentary sanitation conditions and inadequate supply of potable water (Morris JG Jr, 2013). The epidemic potential is conferred by the potent cholera toxin (Crump JA, Bopp et al., 2003). *Vibrio cholera* is autochthonous to the aquatic environment as it is detected in various aquatic environments like brackish water, marine and fresh water and its occurrence in non-endemic areas associated with floods that contaminated water sources. It can survive in some aquatic environments for many months and even years associated with zooplankton and other aquatic organisms (Colwell RR, 1996). Its occurrence in aquatic habitat is influenced by physicochemical characteristics where non-culturable state with potentials to revert to transmissible state when climatic conditions become favorable. This implies that in endemic regions, aquatic environments may serve as reservoir even in the absence of outbreak of cholera. The deep understanding of these factors can help to prevent outbreaks through disease prediction and implementation of timely measures. Cholera treatment involves rehydration to replace the lost fluids and antibiotics to destroy the bacteria preventing disease spread reducing the duration of illness (Kumar PA et al., 2009). Cholera has been endemic in Douala, the economic capital of Cameroon since 1971 as the on-going 7<sup>th</sup> pandemic reached Africa. Outbreaks of cholera have been occurring almost after two years (WHO, 2012). These outbreaks often start in Bepanda, a slum area with poor sanitation and hygiene conditions (Guevart E, Noeske et al., 2006). Although many authors endeavor to study cholera reservoirs even when there is no outbreak of the disease, our focus will go beyond the physical environments but to the meaning that is given to cholera related phenomena in the environmental and sociocultural dimensions.

#### **1.1. Problem**

The fight against cholera has been successful in many parts of the country due to preventive and treatment measures employed by the Ministry of public health. Methods used were biomedical basing on the biology of the cholera vibrio and related etiological routes. Focus was made to stop transmission and propagation through these routes. Despite these efforts, cholera resurfaces in Douala almost in yearly basis and at times episodes lead to serious epidemics with many cases and high mortality rate.

#### **1.2. Problematic**

A biologist like T. Rawlings (2010: 5) wrote on the interactions of *vibrio cholerae* serogroups 01 and 0139 in Douala showing that the presence of algae in water favours the flourishing of cholera bacteria. A geographical approach on

cholera in Douala by J. Assako (2004); *“Etude géographique de l’épidémie de choléra à Douala ou la qualité de vie à l’épreuve des pratiques urbaines”*. He talks of the social interactions like at wells, markets, taxis, churches, marriages, funerals enabling the mixing of population of which the down trodden living in shanty towns and in precarious conditions are the worst hit. Cholera being an acute and one of the most contagious diseases in the world is a public health concern. This implies why the national and international communities are mobilized during outbreaks, epidemics since these can lead to pandemics. Many scientific works exist as biological and biomedical literature. Disease appears not to be an immutable straightforward description of illness as absence of disease but on social, economic and geographical factors that distorts health indirectly and directly.

## 2. Methodology

The research is principally qualitative; though some aspects are presented in the quantitative manner. The qualitative research techniques used in this study are Participant Observation, Direct Observation, In-depth interview, Spontaneous Interview, Focus Group Discussion. Those involved in the in-depth interview were household managers who were mostly women. Hygiene/sanitation aspects were obtained through this research technique. Stakeholders involved in the fight against cholera were interviewed with emphasis on their roles and perception of cholera control and the phenomenon as in its totality. They include hygiene and sanitation workers, hospital workers involved in cholera control, council workers and local leaders. Research materials used here were tape recorders, note taking with the use of pens and notebooks. Coding and categorization was being used in processing of the data. Although voice recording was done using the Dictaphone, notes were taken as an additional reinforcement. This research technique covered all the studied.

### 2.1. Theory

The Critical Medical Anthropology theory comes into this study to point out that the wider society (nationally and internationally) fall short in their role to regulate settlements and provide basic necessities like potable water and means of access to socioeconomic well-being. If there is high accessibility to potable water, for instance, there will be less exposure to cholera in spite of cultural practices and behaviours. Economically empowered people would have relatively changed lifestyle despite their cultures; in aspects like habitats, meals, water usage and the ability to be thwarted from cholera. Therefore, this theory comes into this work to counter the argument of blaming only cultures and typical micro-pathology of cholera but to emphasize on the role of wider spheres of the society in disease propagation. Basic concepts are below.

Critical medical anthropology is a theoretical approach within medical anthropology that uses a critical theoretical framework and focuses on the political economy of health and health care. Political economy, from an anthropological perspective, includes the study of producing and exchanging goods, and the influence of government policy and capitalism on all aspects of life. When applied to studying health and health care, the political economy of health may include ways in which health services are differentially allocated based on wealth, and ways in which policy impacts health and delivery of health services. Political economy of health is a central component of critical medical anthropology, and a critical approach to medical anthropology seeks to uncover hidden causes of poor health as they relate to capitalism and neoliberal economics while examining health structures on a macro and micro level. (Singer, Merrill 1995:26)

During its formative phase, explanations within medical anthropology tended to be narrowly focused on the micro level and involved explaining health-related beliefs and behaviors at the local level in terms of specific ecological conditions, cultural configurations, or psychological factors. From the perspective of Critical Medical Anthropology, these traditional approaches, while providing insight into the nature and function of folk medical models, tended to ignore the wider causes and determinants of human decision-making and action. From the critical vantage, explanations that are limited to accounting for health-related issues in terms of the influence of human personalities, culturally constituted motivations and understandings, or even local ecological relationships are inadequate because this distorts and hides the structures of social relationship that unite (in some, often unequal fashion) and influence far-flung individuals, communities, and even nations.

## 3. Results

### 3.1. Teething and Cholera

In fact, people did not actually consider cholera in terms of teething but majority of the informants said when a child is in this situation, she has serious diarrhoea. As Esther in Bepanda, a housewife said “Cholera is a disease of teething, Esther”, this perception is not unique to this lady from her origin in Mbonge at Meme of the South West of Cameroon but cuts across all the local cultures like the Duala, Bassa, Bamileke. In this case diarrhoea is not a disease but just a sign of change of stage in the child’s life. Some even went further to say it is because the child wants to grow or start walking that is why she is having diarrhoea so that she gets slimmer. Child diarrhoea is well known in the biomedical field and most women are sensitized on that of which they are told to take oral solution. Contrarily, the women’s cultural beliefs overshadow as most children have diarrhoea when they are in this stage.

The relationship between teething and cholera is established when diarrhoea which is an outstanding symptom of cholera is also a sign of change of stage or growth as psychologists of development may qualify. How can diarrhoea due to child growth and that of cholera be distinguished? We question because many children during such a period have whitest transparent watery stool and sometimes accompanied by vomiting. Perhaps during the peak of the cholera epidemic, the

mothers can take symptoms serious but epidemics are often declared late. The child is likely to die or become completely dehydrated before being taken for medical intervention. That is why the head of cholera treatment units talked of the critical situations of most children and numerous evacuations to better equipped hospitals.

This is simply due to the cultural considerations of diarrhoea and many parents could leave the house when the child is having diarrhoea not thinking that it was cholera. Culturalism talks of the influence of culture on the personality and practices of individuals and manifested with proofs showing the close attachment to these. This notion can give another dimension of health seeking behaviour in hospitals; showing that apart from socioeconomic factors and accessibility, a less thinkable cultural perception has a non-negligible influence. Once the parent leaves for work without taking the child, it may be late as many children remain with elderly children at home often.

### 3.2. Breastfeeding and Cholera

The elderly people of 80 and 74 respectively hold firm to the fact that cholera existed in those days called diarrhoea accompanied by vomiting.

"The name 'cholera' came just now but the disease existed because we called it in those days' acute diarrhoea accompanied by vomiting. Vomiting is |devenkuku| and diarrhoea |nzohleh|. There are two types of diarrhoea that occur in a child. Firstly, teeth diarrhoea 2. Diarrhoea due to bad milk because the mother is pregnant but hides it at that time; so, the child takes "impure milk" before cholera was called acute diarrhoea (Momo, and James 80 and 74 years old retired workers from "Dschang, Quarter head).

The nomenclature of cholera may apparently draw less attention in the cholera fight but this perception has come to confirm the fact that what we call 'cholera' has a different significant in different cultures as earlier evocated in other parts of the work. In fact, cholera is |devenkuku| (vomiting) and |nzohleh| (diarrhoea) in Dschang language. Some leaves were used to treat whereas public health reports show that cholera first arrived Cameroon in the Far North from Nigerian neighbouring tribes in 1971 but the old people say it existed when they were children. How can one convince them that this very *nzohleh* and *devenkuku* have now become cholera and needs biomedical intervention? This preoccupation is pertinent here because Nylon which is where these people live and has had very high number of cholera cases of which saturation of hospitals led to transfer to other health districts. Most of them were critical due to delay in consulting the hospital.

Another revealing aspect of cholera of the Bamileke culture, particularly, Dschang is that diarrhoea (|nzohleh|) with |devenkuku| (vomiting) which is synonymous to cholera can be caused by "impure milk" caused by pregnancy. So, when the woman is pregnant, her breast milk is 'spoiled' and gives the child cholera. Another enlightening aspect of this perception is that dishonesty of the woman from saying that she is pregnant leading to continuous giving of *bad* breast milk to the child. Momo even went further to say that it happens in most cases when the woman has gone out with another man secretly. This is because when a woman is breastfeeding in the Dschang culture just like many other cultural universes, the husband does not have sexual intercourse with her. Therefore, going out with another man up to the point of getting pregnant, is betrayal and abominable in the society, that is why the woman does not want to stop breastfeeding so as not to call for attention. This perception has shown how interrelated cultural elements are.

The relationship between the cholera controls with the belief of Momo is that since cholera symptoms are considered as a particular illness in a given culture, they are a revelation of an abominable act like adultery. The potential 'culprit' who is the woman would do everything possible to conceal the secret by treating the baby secretly. This therapy may not be successful in many cases and at times cause the live of the child. The chief in question is having a young wife who was having a baby of less than two years old at the time of study, meaning that the perceptions have a direct impact on the informant. An aspect that has moderated the consequence of the perceptions indicated is that there is a complementary belief in cholera symptom which we have already discussed on; that is the relationship between teething and cholera. This lessening can really be effective if teething has already begun, child diarrhoea will no longer be tantamount to infidelity crime but a change of stage. Clinical signs for *Vibrio cholera* infection often begins usually with stomach cramps and vomiting followed by diarrhoea which may progress to fluid losses up to one litre per hour. These losses result to severe fluid volume depletion and metabolic acidosis. This may lead to circulatory collapse and death (Camilli, et al., 2009).

## 4.Environmental Perceptions to Cholera

Environmental quandaries are preoccupying in Douala even with or without cholera epidemics but there was consistence in environmental considerations of cholera by the population. The conditions in many places were as dramatic as we directly observed what the people were talking of.

### 4.1. Disease Caused by Stagnant Water

The most perceived factor on cholera causation during the study was stagnant water; though cited with others like Mvoro, a hairdresser living in Cité SIC in Douala V Municipality. "*Cholera is a disease caused by stagnant water, going to the toilet without washing hands*". The appearance of stagnant water in order of perception gives us the impression that the nuisance caused by this is not simply cholera but goes to inconvenience in displacement, mosquitoes and so forth. Household members living in flood-controlled areas increased the risk of hospitalization due to cholera, while use of tube well water, defecation in places other than latrines, shellfish consumption, breastfeeding, and malnutrition were not associated with increased risk of cholera (Koo et al. (1996:7). Syndemics lays emphasis on the immediate causes of a disease, forgetting that people most exposed to inundations are the underemployed.

#### 4.2. Disease Caused by Pigs Rearing

Pigs are reared in many parts of Douala where the Bamileke and people from the North West Region live as Eni in "Grand Hangar said; "There are people who rear pigs and throw wastes around us which has pungent ordour, Dschang people. These people whether they do what activity, business or job, they must rear pigs".

Pig rearing is seeming as a phenomenon linked to cholera in many neighbourhoods like Makepe\Missoke, Sodiko, Mambanda and so forth. Pig rearing is linked to cholera in many dimensions. Wastes are often given to pigs as food by mostly those who cannot regularly afford the food for these domestic animals. This practice becomes very common because most of those who rear them barely struggle to survive with meagre resources. The wastes include spoiling food and fruits in dustbins from markets and households. Human wastes like faeces are used by some people to feed the pigs; even though Laurence in Sodiko, a lady of 23 precisely at Derrière Ancient GareRoutière said, "I don't think people still rear pigs and feed them with excreta, it was at first but people's mentality has changed". Indeed, she may have ground for the argument since more and more people buy animal food for their pigs. This does not cancel the fact that many people still hold strong to the old practices; for example, in Makepe\Missoke as well as in many neighbourhoods nearer to the shores of River Wouri and drains depend largely on human and kitchen wastes to feed their pigs.

In Makepe\Missoke for example, there is a clear relationship between human waste, pigs and human beings. As we can see in the picture below, the house is constructed with a link from the house to the piggery and the hanging toilet. This toilet does not have a hole or any reservoir to receive excrements but instead has a container in which people eliminate wastes. Even though the adults do not want to admit that they defecate for pigs in fear of sanction, children spontaneously own up. Nevertheless, this may not be sufficient for the pigs; that is why this is associated with food wastes and *feed*. The notion of wastes is altered and needs to be reviewed as the pigs' excrements are also used in the farms as detailed explanations were given in due course. The toilet could have been right inside the piggery but due to the fear of being bitten by the pigs in attempt to take its meal.

Another aspect of pig rearing is the spreading of the wastes to the neighbourhood. This aspect was largely brought up by many informants as Therese, a 19 years old lady in Sodiko for instance complained saying, "Just beside us here, see pigs being reared with the wastes and pungent smell, such that one cannot even breathe. When tides come, they use this water to wash the pigs and the piggery". Here the pigs are mostly fed with particular pig's food and not excrements as the owners exclaimed on the other feeding with faeces but it is a nuisance and a threat to cholera to the neighbours. When the tides from River Wouri, come up, the washing of the piggery results to the deposition of some of the wastes around the premises of the neighbours living at downward side.

Most of the people who keep pigs here have other economic activities but rear them as a manner of saving money (traditional insurance). Françoise, a 39 years old lady in Makepe\Missoke like many other pig keepers said: "This is what helps us the poor; when a child or anyone in the family is sick, we will sell just one pig and have money to take her to the hospital". She even went forward to say that "if we don't keep pigs, we are finished because the small job I am doing (saving collector for a small microfinance), some months I cannot even earn 30.000 FRS such that we only manage to eat but the pigs can help to solve an unexpected problem". Rose, a woman in her late sixties living in Mambanda, precisely in HAPICAM said: "These pigs I am rearing mostly help me to pay my children's school fees at the beginning of the school year". We can see here that pigs do not serve as insurance only but a kind of asset intended for further investment, which is education.

From the above reasons of rearing pigs explored above, amongst others show that pig rearing is not a superficial economic activity but a well culturally embedded aspect that is mostly common amongst the Bamileke and the people from the North West Region. Pig rearing is mostly attributed to the Dschang as many people from this cultural setting do rear pigs. From investigations, pig rearing was first practiced in the then Northern Province of Cameroon about less than a century ago as Elizabeth 21 years old, hair dresser of Sodiko said:

Pig rearing was first done in the North of Cameroon of which the main customers were the Congolese who used to come and buy them and prepare them to eat. The Nordists who were keeping the pigs did not like eating them. My grandfather went to Congo and saw how they were eating the pork well prepared less than a century ago; it was tasteful. He was amazed; so, he decided to buy some piglets to Dschang and started rearing, the people also tasted the pork and it was tasteful, so he started going to the north to buy piglets to supply to many natives who wished to rear. The love for pigs became so great that any activity in the village required the offering or slaughtering of a pig. The phenomenon became so serious that other neighbouring villages and tribes started buying pigs to keep and it also became the main aspect of bride price, funerals, membership in traditional groups and so forth(Elizabeth, Sodiko,).

From Laurence's story which was revealed to her by the late father, not only has pig rearing spread to similar societies like that of the West and North west. It has gone even to the forest and Coastal regions of Cameroon like the Beti, Bassa and Duala less than a century ago of which it becomes an important cultural item like in dowry, sacrifices, celebrations, funerals. If we see the manner in which pigs are valued in most cultural universes (non- Muslim), it is easy to draw a fast conclusion that it is an old cultural item whereas it just dates back to some decades behind. To justify this affirmation, value is measured in goats since these domestic animals are old in these societies. A goat is a unit of measurement in most Grass field sociocultures of the West and North West Regions of Cameroon.

Since the value of a goat has gone up, a bag of salt is considered an equivalent of a goat for example in the Weh culture of the North West region. The preoccupation here is not to show the diffusion of pigs into our sociocultures but the reasons for the persistence of the activity suitably carried out in the village where it is most needed in cultural activities however, transferred to cities like the case of Douala, in particular where there is limited space and a hostile environment for human settlement. Rearing pigs in villages poses lesser problems because there is a large land where a

house in most villages in the West Region is being separated by a large piece of land from the other. Nevertheless, here, piggeries directly face the doors of neighbours leading to pollution with wastes from piggeries that can lead to cholera spread. Apart from ceremonial cultural value of pigs, they serve as a kind of social security; in case of ill health, death or any unforeseen.

There are neighbourhoods where the population of pigs or the number of pig keepers is reduced due to natural and social selection. In Makepe/Missoke for example Françoise said: "Almost everyone here had pigs behind his house but thieves have changed this pattern. The worst incidence happened here four months ago where about 30 pigs were stolen at night through a toxic product in food that makes the pig to sleep up like dead. Everybody got up and was shock with this. In fact, that is what discouraged most people from rearing pigs" (Françoise, Makepe/Missoke).

Apart from theft, the pig pandemic also reduces pig rearing as Kengou in Sodiko said, "*We used to have pigs but during the last pig pandemic, all our three pigs died and my father was so discouraged to replace them with new piglets.*" In fact, many informants consider pig rearing as the sociocultural identity of Dschang people as this household interviewed are from this ethnic group. Here, we can see that apart from the ordinary control of pig keeping by the authority, which we will explore later, other inevitable and effective factors check these activities.

If we consider pig rearing as an economic activity or a kind of social insurance; then the use of the CMA theory through Sufferer Experience is necessary as the people of a lower socioeconomic status try by all possible means using ways that are culturally inherited or learnt to ensure the ability to solve their problems but this phenomenon is contradicted as the head of the sanitation of the Deido District Hospital said; "*my brother, it was terrible, there is someone at Bessengue who constructed a storey building of which the upper floor was used by pigs the middle by himself and the first floor by tenants. Can one imagine that this man is poor?*" This question was answered by Laurence who is also from Dschang as the lady in question living in Sodiko.

"Even though one can be having money, keeping pigs is cherished because to us it the surest means of keeping money and the bag of money is never full. But the case of that man is too odd and I think the pigs living in the storey building are his totems and if they were killed, he could have likely died." Guevart and Colleaguessaid ; *derrière la case, une latrine côtoie une porcherie, une cuisine, et enfin un petit jardin. Ainsi la chaîne alimentaire est respectée : les excréments humains sont utilisés pour nourrir les porcs car ils contiendraient des vitamines*"(Guevart et al. 2006 : 6).

In fact, we have seen that pig rearing is quite a complex phenomenon just like any other cultural element. Totemism is an indispensable cultural aspect of the Bamileke since animals are used as an additional source of cosmic energy by allying with them. Most often, these people ally with wild animals like panthers and snakes but others use animals that appear like well domestic ones but in the night, they transform to something else. Another manner of locating piggeries is directly beside the house. One will need to know where the toilet is located. In fact, this house in Makepe\Missoke has a place of defecation in the piggery which the human excrement is directly given to the pigs in a safe tiny part of this hut. This goes further to illustrate the interrelationship between human excrement and pigs.

#### 4.3. Gutters and Cholera

There are neighbourhoods in Douala having gutters with a stinging liquid like in New Bell and Deido. Awa in New Bell said; "here all the gutters are fowl smelling showing the high level of contamination in New Bell". Even though Deido has fowl smelling gutters, they are not evenly distributed like in New Bell. The relatively, sparsely built houses enable better water canalizations and smelling gutters are mostly around the tarred main road such that there is less perturbation.

In New Bell, gutters overflow and run to people's houses and within the quarter, people construct houses and block water passages such that wastes deviate to people's houses. Most household members are habitual with a pungent odour that does not only welcome someone outside but succeeds to penetrate right inside the sitting room. Human wastes constitute the major content of these gutters. A new comer (during observation) has a very significant shock of living in a continuously uncomfortable environment.



Figure 1: Fowl Smelling Gutters in New Bell  
Source: Fieldwork

The blockage gutters are at the center of cholera transmission as contaminated water overflows from there to habitations. Gutters are blocked due to plastic bags and containers as well as grass in the case of drains. Anarchical construction most often is the dominating factor of causes of flooding.

This is one of the major preoccupations of Douala residents; not necessarily due to cholera but the nuisance. This brings about as foul-smelling water remains on one's door or business place for long as well as excrements. It is the place of the local authorities to ensure that the gutters are emptied. Even though throwing of plastic bags on the street by the population is also responsible for gutter blockages, a better waste disposal policy could be more adaptive. Similar situations were in other countries like Ghana and Kenya where plastic bags are being recycled. Easy decomposable materials for packaging are ordered and implementation of a law banning the importation of plastic bags like in Nigeria. That is why CMA (Vertical links) talks of the influence of the larger society to the incidence of a disease because most often the propagation of some diseases is simply a reflection of the socio-political as well as the politico-economic situation of the society. This is because a political system has the power to control through coercion and policies.

As we can see the photo above, the gutter contains algae which is said to have the capacity of keeping the cholera vibrio alive for quite a long time than ordinary water. In mid-2013, the Douala Urban council used almost two billion Francs for the evacuation of some gutters so that water would pass. This is not quite appreciated by the population as the Chinese company doing the work dumps the dirt around which would enter back to the gutters during down pours.

#### 4.4. Anarchical Construction and Cholera

The blockage of gutters due to the anarchical construction of houses is very common in Douala especially in New Bell, Bisseke, Mambanda, Bessengue and so forth.

"Gutters are blocked due to many reasons; one of which is anarchical construction. In Bonassama there are serious inundation problems here since the locally dug gutters are blocked. We struggle to empty these gutters with our bare hands because we do not have tools. A series of gutters usually has a common junction, when blocked partly by people who throw dirt inside and by the grass inside the river does not allow easy flow of water. In fact, when it rains, you cannot sit in the verandah where you are now; the water also enters into the house. To be honest with you, it is God alone that makes us not to have cholera. When it rains, the children in the primary school beside my house have to be carried to enter in the school(FGD, Bonassama).

In order for him to succeed to build a two, rooms, one pallour house. Due to the small plot of land available, there is no allowance for a gutter, so the gutter is either intentionally directed to other neighbours' houses or wastewater is allowed to choose its direction.

The Health Ecological point of view sees the practice of blockages as an indication of inadaptability to the present environment due to lack of space as constructing where the gutter is supposed to pass is a nuisance and a compromise to adaptation not only to the neighbours but the one blocking the gutter too. The CMA theory questions the ability of the political power to control people's behavior; there is the need to coerce; especially in a complex environment like that of Douala, yet anarchical construction is tolerated. Apart from temporal determinants and spatial factors, several human related factors have been associated with cholera transmission in inland Africa. Many outbreaks affect slums in inland Africa like in Ouagadougou in Kumasi in Ghana, and Bauchi in Nigeria (WHO, 2009: 85).

#### 4.5. Obstruction of Drains

Drains provide some space for water from tides and rain to pass so that houses are not to be inundated. These drains are blocked by nature or people, as Kuom in Bisseke testified; "The main reason for inundation here is the blockage of gutters is the bridge that is about 200metres from our house because there is much grass inside

The grass has blocked the water in the drain such that when it rains, even a bit, not only is this tarred road (on the right of the photo) flooded, so too are the houses inundated. Water on the extreme left is blocked by grass and this grass continues throughout the neighbourhood, surrounding it; forming what they call a lake that a passer-by can call thick grass; especially in the dry season. All the people interviewed in Makepe\Missoke pointed an accusing finger on the bushy drain. Kamga, for example, a forty-seven years old man living in this neighbourhood said:

"In fact, the major problem in this quarter is the drain blocked by the grass; making water to overflow into houses, it is necessary for the authorities to clear the drain so that the water will flow away. As you can see this stretch continues right to Bepanda, so the issue is just to allow the water to pass. The bridge on the tarred road is to shoot; making the flow of water too slow such that during heavy rain, it covers the road and concessions"(Kamga, Missoke).

Makepe/Missoke is not the only neighbourhood having this problem, there are many other drains blocked in Douala like the Bisseke and many others. There is overgrown grass in the stream such that water becomes invisible. The occupation of the space by the grass pushes any incoming water to people's houses and compounds. As we can see the bridge, the least rainfall leads to overflow of water on the road. Influential people also block drains with their houses as wells as plastic bottles but much this will be seen in other chapters of the work. From the Ecological perspective, the water in the drains has a lot of sewage rich in plant nutrients such that plant growth is favours; coupled with the abundant water. This situation could have been checked if there are resources to constantly clear the place and even canalize it using cement. The Vertical links emphasizes on the role of those of higher socio economic and political power to coordinate sanitation or promote a conducive environment for community work and voluntarism.

#### 4.6. Soil Is Not Permeable

Most landscapes recover and remain dry after a heavy rain since water sinks into the pores of the soil but in Doula, the soil is mostly clay such, having smaller and sleepy particles making water to stand for days and weeks on the ground depending only on evaporation. Even if the soil were to be permeable, the very high-water table will still make it difficult as in some places just by digging half a metre, one finds water. Also, if water was well canalized through gutters it

could reduce the quantity of idle water. The flat nature of most parts of Douala with few exceptions like in Parts of Madagascar\Nylon and Logbaba that have some gentle slopes makes water flow to be limited due to non-assistance of the gravitational force. Instead, flatness was not perceived as linked to cholera spread the informants. Permeability as an environmental aspect linked to cholera spread was perceived by very few informants; except the sanitation technicians in the hospitals and councils. Carine, in Forêt Bar is one of the few who had this perception "The type of soil impermeable meaning that it does not allow water to pass through, people buy marshes soil, gravel and fill".

From the Ecological perspective such a hostile environment is not favourable for ordinary settlement as it favours disease spread but could be rendered habitable through adaptive means using permanent materials like stones and cement blocks to construct as a kind of land recovery. The CMA approach argues that adequate adaptation requires some level of financial means, which is limited to most of those living such waterlogged environments as they are mostly working with meagre incomes. Some of these dwellers involve in subsistent commercial activities.

#### 4.7. Fishing in Water Sources of the Neighbourhoods

There are water features where fishing is carried out by the local population. Examples are around the shores of River Wouri in Deidoshants, Mambanda and the Makepe\Missoke Lake. Roland a man of late forties living around this lake said; "many people fish in this lake and I know one Hausa man called Adamou who fishes in this water depending on it for livelihood. Sometimes very big fishes called *Cameroun* are caught of which one is sold at 8000 FRs." Indeed, Adamou fishes in this lake, married to one wife, having three children. The drain is where most of the kitchen and human wastes especially in shantytowns collect. Such water features are considered as a potential cholera reservoir by the public health officials. The first cholera cases in Douala are said to start from Missoke, a renowned drain before propagating to other neighborhoods. In Deido, the outlet of River Wouri is also a fishing ground for many since many plant and animal products constitute stable meals for the residents at the river bank.

Fishing in these waters does not constitute any problem but the issue now is that these water sources are too near to densely inhabited neighbourhoods constituting a major means of ensuring cholera endemicity. This is because from the biological literature of cholera, the aquatic environment is a natural environment of cholera; implying that there are factors like the presence of phytoplankton, zooplankton, salinity enabling the survival of the cholera causing microbes called *Vibrio cholera*. From the Ecological perspective, the people depend on their environment for subsistent and this environment is a determinant of health. If the environment determines one's culture, it also determines the type of diseases that affect the people. That is why such neighbourhoods always have cholera cases; especially at the beginning of the cholera epidemic.

Similarly, within a particular geographic location the organism can persist for many years, which may explain the reappearance of the disease after a long period of quiescence or apparent absence (Colwell, 1996: 44-54).

#### 4.8. Pools of Water in Compound during Rainy Season

There are dwellings that are permanently having water. It is common in some parts of Grand Hangar, Forêt Bar, Mambanda and others. These pools are common during the rainy season in Bonassama, Bisseke, Makepe\Missoke, New Bell, Nylon and so forth. In Bisseke for instance, in most compounds water fills the whole compound as Thomas during our second research phase in February, said; "as you can see this compound is dry now, in the rainy season it is a lake of water, during this time we swim out of it". Indeed, our visit in that compound in July showed a pool of water confirming what he said. The reason for this issue is simply that the houses have surrounded the compound, allowing water to get in with less possibility for the water to get out. Coupled with the very high-water table with a few centimetres dig, one sees water. The nearness of most of these neighbourhoods to the banks of River Wouri makes the habitation in this environment impracticable yet people who live there consider themselves unfortunate or economically not favoured. They say this is the only place they could afford a plot of land or rent a house since they are cheaper.

Moreover, there is a direct link between the pool of water and cholera as the water mixed with excrements sometimes reaches the rooms and soils their property. Adaptation through land recovery and adequate infrastructures, regular balance diets and feeding characterized are not often affordable. Majority of the residents due to lower socioeconomic inevitably increase the vulnerability of the people to disease because resources are not equally distributed, and the lack of equity is generated by *political and economic forces*, resulting in a concentration of poor health and less health resources among marginalized populations. This is because the dose of virulent microorganisms like cholera from in mere lightly soiled objects may not result to disease to household members who are well fed. Conversely, during our studies, there were homes in most of such environments that are not sure of two average meals and some cases, even one. This shows how economic hardship directly and indirectly exposes people to disease and subsequent mortality. This may be a kind of social Darwinism where those who are socioeconomically favoured are selected; that is are likely to live longer and reproduce if other variables are stable. In addition to environmental characteristics that can stimulate the reappearance of cholera in an area, a number of human behavioural risk factors are important in the epidemiology of cholera. A study in Burundi indicated that bathing in and drinking water from Lake Tanganyika was significantly associated with illness. Furthermore, an observed increase in the risk of becoming ill with increasing time spent in the lake indicated that there was at least a moderate dose-response relation (Birmingham et al., 1997).

#### 4.9. Children's Leisure and Cholera Diffusion

The standing water in marshes, drains and gutters constitute are playing ground for children. During the study, it was noticed that the phenomenon was too common in neighbourhoods like New Bell, Mambanda, Forêt Bar and so forth.

Although only few informants actually raised the issue of children playing in polluted water in gutters and marshes, most came from New Bell as Sandra, a 35 years old trader said: "The gutters are highly infested and children play inside". Investigation on this trend reveals that the types of economic activities carried out by the people are commercial in most quarters in Douala; particularly in New Bell making parents to be very scarce in their houses, leaving children on their own or not having a reasonable time to follow up the activities of the children. It is clear that to control children from playing on infested water is difficult; if the water is not inside the house it is outside.

However, some children leave their houses and go and play a distance away inside filthy standing water. What even worsens the situation is that not only very little kids do play there but also some of nine years and above who can already reason. This kind of attitude makes us to question the type of education given to children in school and at home. If emphasis is only made on hand washing without contextualization; that is many children are living in marshy areas and need to know the dangers of the waste water. Transplantation of the western conceived system of cholera control makes people to neglect the reality lived by many people in Douala.



Figure 2: Children Playing in Filthy Water in Grand Hangar, Douala  
Source: [Kah](#)

It was also noticed that while the children were playing, elder people pass by and do not care to rebuke them whereas they know that they are not doing the right thing. The Culturalism theory involves comparing the typical village context where the people have come from where a child belongs not only to the immediate family but to the extended family as well as the entire society. In fact, this manner of doing still exists in villages today despite Westernization but absent in cities where people come from different societies. Capitalization instead of communalism that was some characteristics of African societies has given rise to individualism limiting the family only to the nuclear one. This affirmation is justified by the fact that even in non-metropolitan neighbourhoods and towns' oversimplification of the family exists. This reveals the implication of transplantation of cultural values that were conceived in the societies of Western countries with a relatively high standard of living. There, one could stay independently from the neighbour as there is no infested standing water outside; there is abundant drinking water, food to eat and so forth. Contrary here in Douala where most of the people live in deteriorated environments, in failing living conditions; require the communal and friendly sociocultural system that is self-supporting. This situation even though it is likely to be bypassed but cannot not escape from the anthropological lens as these people; especially children are more exposed to cholera than their counterparts in the villages and those in luxurious neighbourhoods of Douala. In many neighbourhoods, children were the vectors and the same time victims of cholera; even in the luxurious neighbourhoods.

#### 4.10. Lack of Social Infrastructures

There are neighbourhoods in Douala that lack adequate infrastructures. Among other reasons like lack of sufficient investment funds like in Mambanda, other neighbourhoods do not have public infrastructure like roads, water and electricity, which is the case of many parts of Nylon like Oyack and Makepe \ Missoke due to their consideration as no go zones (settlement risk zones). The amazing issue in these neighbourhoods is that signboards are placed indicating that these zones are unauthorized for settlement yet day-by-day plots of land are bought and houses constructed. "We are in a quarter that was not planned, so it is a spontaneous neighbourhood. Last time I went and reported one of my residents in the council because his toilet was full, overflowing and badly placed. Surprisingly, I was told to deposit an amount of money that will be used for displacement to convoake the culprit. I left and no action was taken since I don't have any authority to sanction" (Quarter head in Oyack).

Oyack in Nylon of the Douala III Municipality has no motorableroads, even motorbikes reach there with difficulties when carried across the broken wood bridges. Due to the inaccessibility of these neighbourhoods, other facilities like water and household waste disposal facilities. That is why in Oyack and other enclave quarters in Douala have hips of dirt, which the local population complain but cannot change the situation. The quarter head of Oyack complained that "road construction works began three years ago and stopped such that the 3Km road was left unconstructed leaving this quarter enclave." After investigations with the Douala III council, it was revealed that some of these neighbourhoods are illegally inhabited and the case of Oyack is that the land belongs to the MAGSI (*Mission d'Aménagement et de Gestion des Zones Industrielles*) industrial area. This means that road construction will instead encourage more settlement whereas the land needed to be liberated.



The quarter head confirmed: "Moreover, this quarter has not been traced yet. So, it is risky to invest on an unplanned quarter. This is because the road may pass where the building is". The problem of cholera is more systemic than it appears as it is more of medical hegemony (Ember, 1995) for the people are allowed to settle in cholera risk zones and lead clustered densely settled populations of very low socioeconomic level. When a cholera outbreak comes, the local authorities pretend to prevent by concentrating only on the micro-epidemiological aspects without exploring permanent solutions such as improving of general living conditions through employment opportunities or a comprehensive social control that can be obtained through transparent management of economic resources.

#### 4.11. Disease and Residence

Cholera is a disease due to living in dirty places as expressed by a meagre fragment of the informants. Most of these people actually live-in milieus that are unfavourable such as marshes, decaying woody slumps, bushes, non-permanent toilets and so forth. Among them, Atanga living in Oyack\Nylon says: "Cholera is when we drink dirty water or live-in dirty places". (While saying this, Atanga and Jeanne were pointing at a hip of dirt about 60 metres from their compound saying that) "look at the hip of dirt thrown by all the people in this part of the quarter, since HYSACAM cannot come due to the enclave nature of our quarter, we have no choice, though this helps to fill up the valley, it is also a source of cholera. (Atanga, Oyack).

They could easily perceive cholera as a disease of dirt because they pointed the refuse far from their house. Their compound was made up of cement houses and canalization gutters with no inundations (unlike most parts of Nylon) but this is not the case with those in Bisseke, most part of Mambanda, Grand Hangar and so forth permanently immersed in filthy water and New Bell characterized by foul smelling gutters due to faecal wastes. Those living in filthy environments have the tendency to take these as normal to a certain extent or have become used to it that they no longer perceive it. Although the residents of this compound in Oyack complained of refuse-dumping it is far away from them but their compound looks neat. One non-negligible aspect that makes people to perceive cholera to dirty places is avoidance of self-criminalization, as people in risk marked places like Makepe\Missoke, Bisseke and so forth do not want to link their environment with cholera causes since it will imply complaining. I can remember of the residents of Makepe\Missoke during an in-depth interview saying that: "I should tell you so that you come and break us". It was a question related to the harshness of their inhabiting environment such as inundations and water accessibility. There was the need to prove that one is not a communal or government agent to ensure the openness of the informants.

In this light we discover that link on the relationship between cholera and dirt are influenced by conscious and unconscious factors. People do not want to express their feeling of dissatisfaction to their environment to avoid authority's demolition as well as other sanctions even in neighbourhoods where the threat is less yet people no longer perceive non-perturbing environmental threats to cholera. Ignorance or non-awareness can be a contesting factor to the above affirmations but sensitizations and peers influence have raised the level of understanding of cholera aetiology in all parts of Douala. Gary Garner (2006: 14) talked of the relationship between housing and health outcomes where he wrote that the Living conditions are widely acknowledged as a major contributor to the health and well-being of particular population groups, with strong relationships existing between environment and human physical condition.

The housing notion has been used as a primary measurement tool in determining the extent of human happiness, i.e., quality of life. The ecological perspective also gives rise to a growing emergence of the importance of the modern "interdisciplinary approach" underpinning trans-disciplinary research and professional practice. This integrated model combines biological, cultural, economic, political, psychological and social factors. By default, it cuts across a number of disciplines including property economics, town planning, engineering and medicine. Further, commonalities that may exist between both indigenous and non-indigenous communities have implications for improved planning especially in the area of public housing policy (Gari Garner, 2006: 14).

Relating toilets behaviour to cholera has unexpectedly not been mentioned by most of the people under study but Mvoro, a hairdresser in *CitéSIC* said: "It is a disease caused by hygienic problems, stagnant water, going to the toilet without washing hands" (Mvoro, hairdresser, 30, Nguma Cite SIC).

Despite the fact that Nguma did not mention hand washing after going to the toilet, it at least shows a kind of awareness. Whether the toilet is constructed or not going to the toilet implies emptying the bowels. The households visited in the study showed that the parents do train their children to wash their hands before eating and some emphasis is made on toilet's behavior. Perception of toilets behavior on cholera can reveal awareness to biomedical etiology of cholera but it is not significant as those who hold to this are very few. Excrements have always been classified among the non-desirable objects in most cultural universes of the Bamileke, Bassa and Duala though the introduction of intensive agriculture has reshaped this consideration due to the use of excrements in agricultural activities.

In some cultures, rites of restoration after an abominable act (the case of incest in the Beti culture) excrements are used to bring the society and more precisely the culprits closer to nature and detestable aspects; like amongst the Ewondo. Moreover, it is due to the ugly nature of excrements that when someone is obliged to swallow it, will not only prevent him from going back to the same errors but will also scare the other members of the society. Instead, the so-called modernization has brought the people closer to their excrement through agricultural practices though it is not biomedically healthy. If agricultural practices involve the use of excrements, then there will be a closer relationship to it such that less emphasis of hand washing after manipulating it or defaecation like the farm in HAPICAM\ Mambanda, amongst others whose farm is being fertilized with excrements.

In the same light, Rosenkrant wrote "Social disease typically affects the socially marginal, who can hardly afford to wait for the fundamental insights and social transformations that challenge the well-established transformations of

disadvantage and disease" (Rosenkrantz, 1997: 356). Consequently, within CMA health is defined as access to and control over the basic material and nonmaterial resources that sustain and promote life at a high level of satisfaction. Health is not some absolute state of being but an elastic concept that must be evaluated in a larger socio-cultural context".

## 5. Discussion of Results and Conclusion

Although the article duedled on aspects of cholera that are not far from WASH (water, sanitation and hygiene). The study explored aspects that are related to some societal values, organisation of habitats and town planning with emphasis on the politico/economic aspects of the phenomenon. Even if, some beliefs appeared to be somehow alienated to the biology of cholera, they however related some of the symptomatic aspects the disease to the system of norms and values making pertinent revelations in terms of cholera control measures. Despite the fact the populations established different links on cholera, they all acknowledged absence of sanitation and hygiene as linked to cholera aetiology. Awareness created through contact between the population and cholera sensitisation message has a non-negligible role in addition to their exposure to the disease due to its endemic occurrence. To Geertz (1973), culture provides people the ways of thinking as well as models of reality. Despite the fact that the cultures of the populations have shaped the people's world view on the sense they give to phenomena as well as their reality, including the persistence of rudimentary subsistent activities that do not only expose them to cholera but foster cholera propagation, the critical medical anthropology approach holds on the fact that the socioeconomic situation makes people to live where they might not be living and carry out activities just for subsistence. The contribution of this study in cholera control lies on various beliefs related to cholera symptoms especially amongst children. Although studies are carried out on cholera endemicity within and without endemic periods to determine the presence of *Vibrio cholera*, there is need to study awareness by the population about cholera reservoirs like algae and other features.

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