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RESEARCH ARTICLE

DIFFICULTY OF ACCESS TO DRINKING WATER AND STATE OF HEALTH OF THE POPULATIONS OF GLAZOUÉ IN BENIN

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Abstract

Drinking water is a basic resource for all living things. Its quality influences the life of living beings. The present research aims to analyze the difficulties linked to access to drinking water in the municipality of Glazoué and the state of health of the populations.The methodological approach used consisted in using documentary research techniques, interviews, observation, analysis of the water collected and compared with WHO standards. For this research of a mixed nature, 110 actors were surveys, 4 water sources analyzed and statistics of water sick people collected. The data were processed and analyzed by comparison and the PEIR analysis model made it possible to analyze the harmful effects caused by the consumption of unhealthy water on a predominantly rural population with low and limited income with its socio-economic consequences.The populations of Glazoué are confronted with a water deficit in this case during the dry season. The majority of wells dry up during the dry season and thus expose populations to the risk of water contamination due to the fact that the water from these types of wells is filled with sand and microorganisms. As for modern wells and boreholes, poor management is the main cause of their abandonment. Any situation that predisposes people to resort to water sources of questionable quality that endanger their health.

Introduction:-

Water is considered a good, like air, as essential to human life. It is the most crucial of natural resources and which makes life possible and sustains human ecosystems and businesses. Water is both a strategic resource and the fundamental basic element necessary for a healthy economy (L. Odoulami, 1999). Access to this resource still poses enormous difficulties in several regions of the world, particularly in developing countries. In fact, approximately one billion four hundred million human beings in the world in 2003 still did not have access to drinking water and among them, 450 million were located in Africa (M. Gauthier, 2004).

While about 85% of the urban population in Africa have safe drinking water, 55% of the rural population still do not have access to it (Enterprise Works World Wide, 2003). The situation is especially alarming in desert and Sahelian countries where a liter of water is worth more than a gold ingot (water is obtained in some desert countries by exchange for gold, sometimes the existence of this metal does not guarantee any security in the water supply

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because it is acutely lacking). Nationally, the supply of drinking water in rural areas remained fairly low in 2003. However, the situation still forces more than half of the rural population to obtain supplies from the backwater, the river, the unprotected well and even from tanks filled with rainwater and poorly maintained.

Today it is the subject of great concerns of heads of state and government and of several national, regional or international institutions such as the African Union, NEPAD, WHO, UNICEF etc. , given the stake it represents in human life through several projects or programs.

In Benin, populations continue to suffer from the quality of the water, such as those in Glazoué in the Collines Department. The harmful effects of the difficulties of access to drinking water on health and hygiene are also a major factor in the vicious circle of poverty in this municipality. The burden of fetching water falls on women and children, who often have to travel long distances, leaving them less time for income-generating activities, education, etc. Like other localities in the Hills, the populations of the commune of Glazoué lead a difficult life to obtain drinking water (Capo-Chichi, 2006). The population is exposed to various water-borne diseases. So, the public health problems of this locality are due in large part to the lack of sufficient clean water and the management that is done (Blalogoé, 2000). Consequently, the Supply of Drinking Water constitutes one of the major problems of the commune of Glazoué.

In the commune of Glazoué, demographic growth, economic development and the lack of hydraulic infrastructures constitute elements justifying the non-satisfaction of the demand for drinking water. Thus, the efforts or sacrifices made by all layers of the population have hitherto remained less effective. Indeed, the State, in collaboration with NGOs and development partners, have undertaken major projects to build modern water infrastructure to supply drinking water to the populations. However, meeting water needs and improving the service provided by hydraulic structures remains a challenge today.

Materials And Method:-

This work seeks to analyze the modes of drinking water supply in the municipality of Glazoué. To account for the problems linked to the supply of drinking water in the town of Glazoué, a methodological approach is required. That which is envisaged within the framework of this research comprises essentially three phases, namely: documentary research, data collection in the field and data processing. For this, it emerged the modes of supplying drinking water in actors in the municipality, the involvement of actors in the management of supply structures, the problems related to the supply of drinking water and their adaptation strategies. in the face of water-borne diseases. The research is therefore qualitative in nature but was based on some quantitative data.

The various actors concerned by this research subject are the municipal authorities, the heads of the arrondissement, the NGOs, the heads of districts, the opinion leaders, the religious leaders they are the influential actors in the villages or districts. They are the first players involved in the construction of drinking water supply structures. The men and women, the peasants, the teachers…, that is to say the members of the communities; they are the most concerned in that they are the victims of water-borne diseases such as chronic diarrhea, especially in infants, children and adolescents. Their perception of water and response strategies are necessary.

The research having a qualitative basis, the options made refer to reasoned choice and accidental sampling but also to the simple probability technique. The reasoned choice is used to obtain information at the level of communities, municipal and local authorities, humanitarian actors, and traditional leaders. Apart from reasoned choice, accidental sampling is used to obtain information from communities and the simple probability technique for grassroots social actors.

In addition, a water sample was taken from the SODECO borehole for bacteriological analysis. Not being able to analyze the water from all the supply sources of the municipality, priority is given to the water from this borehole, because of its more popular nature of permanent use and service and taking into account its maintenance, its private or internal management.

After the work in the field, it is important to analyze the information collected, compare it to reality. The data collected in the field made it possible to understand the strategies put in place for the supply of drinking water and the resulting problems. The writing, the realization of tables and others are done using the appropriate computer tools.

The Commune of Glazoué is a rural area located in the heart of the Collines department, 234 km from Cotonou, the economic capital of Benin. It is bounded to the north by Ouèssè and Bassila, to the south by Dassa, to the east by Ouèssè and Savè and to the west by Bantè and Savalou. The Municipality has 48 administrative villages spread over ten (10) districts which are: Aklampa, Assanté, Glazoué, Gomé, Kpakpaza, Magoumi, Sokponta, Ouèdèmè, Thio and Zaffé. Glazoué is a town in south-central Benin, capital of the town of the same name. Its population is 124,431 inhabitants in the 2013 census (INSAE, 2013).

Results And Discussion:-

Drinking water supply methods in the commune of Glazoué:

Several means or techniques are used by the population of Glazoué to reach water. Among these modes of supply, others are described as archaic and do not make it easy for the population of Glazoué. The meager financial means available and technologies do not allow the population of Glazoué to have easy access to drinking water. In order to meet their water needs, people use various water sources of different nature and characteristics.

Traditional wells and water bodies and their characteristics:

The wells observed in the locality are no different from those found elsewhere. In general, they are characterized by an almost total absence of coating or lower coverage. They sometimes have a cement coping 0.5 to 1 m high above the ground with a diameter varying between 1.5 and 2.5 m. The depth of these wells is between 6 and 15 m depending on the villages or city districts. The negligible or shallower depth of the wells in the locality is explained by the rocky outcrops encountered throughout the locality. Plate 1 respectfully presents a traditional well and a body of water in the commune of Glazoué.

Plate 1:- Traditional wells of the municipality and Lake of the municipality of Glazoué
Shooting: Field data, Babadjidé, October 2019

Plate 1 shows a traditional well and a body of water. These water sources are open, poorly protected and thus receive all kinds of atmospheric waste and even runoff.

Modern wellsand borehole water pumps:

Modern technologies:

They bring together the mainly material and human resources available to a company specializing in the field, to access water tables on any site in the long term. The wells are drilled by experienced well diggers from Porto-Novo, Adja and others. In reality, the realization of these wells requires not only heavy equipment, but before, studies making it possible to identify the nature of the water table to be exploited in order to decide on the type of well which is appropriate. Their speed is higher, and they can meet all needs. These are wells composed of three parts:

1. **Surface equipment:** coping, slab and ancillary equipment, sometimes even drinkers.
2. **Casing:** from ground level to water level; it is generally made of concrete and consists of full prefabricated nozzles; it can also be cast directly.

3. **Catchment:** part penetrating into the aquifer, it is made up of perforated nozzles, penetrating to a sufficient depth in the water table (from 4 to 6 meters, or even more). A mass of gravel, interposed between the ground and the nozzles allows the water to be filtered and prevents the well from clogging.

Indeed, after taking stock of the time and energy lost at the well to obtain water, well compare to the financial expenditure for the purchase of water from the Soneb, some people choose water of dubious nature. by financial constraints.

There are also some modern large-diameter wells such as the one in Plate 2 which shows a modern large-diameter well and a human-powered borehole from the town of Glazoué.

Plate 2:- Modern large-diameter well and human-powered drilling in the town of Glazoué.
Shooting: Field data, Babadjidé, October 2019

Plate 2 shows a large-diameter well without a cover and a human-powered borehole that supplies most of the populations of Gomè and Orokoto in the commune of Glazoué. Located near a main road, the well also stores waste; which pollutes its content, the water.

As for drilling with mechanical motricity (pump), its environment is carefully cleaned; only that the open tank built to collect the dirty water was filled with waste. It all gave off a foul odor.

Before coming back with more information, it is urgent to stress that throughout the commune of Glazoué, the number of functional wells remains insufficient for a population in full demographic growth.

Like the world situation, the sources of water supply, especially drinking water, are unevenly distributed in the villages and city districts of Glazoué.

The first reason for the scarcity of private then stems from the high cost of drilling wells, the size of which depends on their depth. In the locality, this depth varies between 6 m and 15 m and is conditioned by the hard granite rocks encountered almost everywhere in the town.

Thus, the cost of local labor for the drilling of a well is 3000 F or even 5000 F per m3. The meager income of the populations often cannot cover the expenses necessary for the implementation of a well by each household. With finishing, the price varies between 150,000 F and 300,000 F. While an entire locality would have a village water supply only if it has a sum of 250,000F at the CLCAM (CCS Glazoué, October 2019).

In general, Table I gives an idea of the different types of functional water infrastructure or not in the whole municipality.

Table l:-Type of drinking water infrastructure in the municipality of Glazoué.

Years	FPM function nel	FPM not working nel	Chateau Sodeco	AEV	BF	Functional Soneb pumps	Non-functional Soneb pumps
2006	125	19	4 (BF)	3	11	338	113
2007	216	-	4	3	18	336	115

FPM: Manual Pump Drilling; AEV: Village water supply; BF: Good fountain
Source:- Glazoué Town Hall, October 2019

Through table I, we can see that there is a low coverage of drinking water (241 point including the good fountains of AEV and SODECO for a population of 90,475 inhabitants). At least 121 more water points are needed to reach the international standard which is one water point for 205 inhabitants except the SONEB network (which does not cover all the districts). Table II shows the water supply rate at the district level.

Table II:-Drinking water service rate.

Year	Aklampa	Assanté	Glazed	Gome	Kpakpaza	Magoumi	Ouèdèmè	Sokponta	Thio	Zaffé
2007	48%	53%	42%	7%	47%	42%	53%	74%	57%	54%

Source: Service Eau Colline, October 2019

From Table II, we can see that at least half of the populations of the districts of Assanté, Gomè, Ouèdèmè, Sokponta, Zaffé and Thio are served with water qualified as potable, but the other districts, less than the half of the population is served with this water qualified as potable and scarce.

In addition, today, taking into account several factors such as demographic attraction and the aging or degradation of existing materials for supply, the population of the municipality is far less served. Thus, the demand for hydraulic drilling and subscription to the Soneb network is increasing. The SODECO factory, the international market and the CEGs are mainly responsible for the increase in demand.

Feeding and vulnerability of the water table:
Most of the water used by living beings, namely humans, animals and plants, has only one origin: atmospheric water. This atmospheric water is mostly found in continuous recycling and not in a static state. Atmospheric water that has fallen to the ground in the form of precipitation in tropical and equatorial zones can be divided into two categories: one part infiltrates the ground to supply the water table and another flows on the surface towards water courses. 'water, lagoons and lakes. The nature of the soil does not favor the construction of wells and boreholes

Difficulties linked to the permanence of water in water sources:
Large diameter wells found in places generally do not contain full time water. During the dry season, the plight of the populations appears and difficult to live; almost all water points are drying up. Worse still, the hydraulic infrastructures installed in Glazoué by Soneb provide water irregularly with a very reduced flow and untimely cuts. The same phenomenon is sometimes observed in the boreholes installed in the villages. The hand pumps installed also fail and access to spare parts is also difficult.

Difficulties related to the installation of wells:
The commune of Glazoué is part of the crystalline peneplain of central Benin, the Hills region, the site is built on a rocky base with their outcrops encountered almost everywhere only a few meters deep or even on the surface.

Sometimes, less than 4 m deep, the wells are already blocked because of the very hard rocks they encounter. Thus, the installation of wells is difficult or even impossible in certain concessions of the municipality. Not having modern drilling tools, the well diggers use wood fire (sometimes a "tarpaulin" of burnt wood to perforate or alter a few cubic meters of hard rock). This difficulty is much more encountered in most of the villages crossed such as Gomè, Sokponta, Thio, Glazoué center, etc. For example, a householder (living in Ayédèro) spent more than a trip on wooden sheets to be able to finally drill a well about 9 m deep and which only gives water during the rainy season.

Board III:- Equipment in public hydraulic infrastructures of the municipality of Glazoué.

Type of infrastructure	FPM number	Number of FPMu	Number of FPMab	Number of BF	Number of Bfu	Soneb subscribers
Aklampa	63	60	3	3	3	-
Assanté	36	33	3	-	-	-
Glazed	19	17	2	-	-	242
Comè	20	20	-	5	5	-
Kpakpaza	16	16	-	1	1	-
Magoumi	17	12	5	-	-	17
Ouèdèmè	33	26	7	-	-	40
Sokponta	21	16	5	10	10	-
Thio	31	29	2	-	-	-
Zaffé	28	24	4	-	-	39
Total	**284**	**253**	**31**	**18**	**18**	**545**

Source:-Soneb Dassa and DH- Dassa, October 2019

Analysis of Table III reveals that more than half of the arrondissements do not have good fountains; as well as subscribers to Soneb.

In addition, most wells are not disinfected or even treated once a year due to user negligence, ignorance of waterborne diseases and lack of regular monitoring by the local hygiene and sanitation service. .

Difficulties related to the installation of boreholes (pumps):
The number of boreholes available is much less than what is needed. The water in boreholes is often considered less polluted because of their depth (60 or even 90 m), depending on the location and the level of the aquifer or water table. Most of them no longer treat this water taken from the groundwater or do so with negligence, which does not guarantee good water quality.

In addition, there is often a shortage of water at supply sources during the dry season. During this period, the water level of the groundwater drops and the drainage system is no longer satisfactory. Likewise, in some localities where borehole water cannot be sold, it is difficult to change parts in the event of a major breakdown. Sometimes it is the management committee that uses the resources for personal needs and without justification. To settle or repair the breakdowns you will have to go to Dassa or Bohicon before finding the replacement parts or even the specialist who sometimes came a few days or weeks later.

In addition, the request for drilling is subject to a whole memorandum of understanding which requires a payment of a sum of 250,000 F CFA by the base committee, or base population. This state of affairs forces the population to be content with water from backwaters, rivers and others, the taste of which they qualify as pleasant.

The number of hydraulic works is therefore very insufficient and only meets a small part of the needs of the population. So, the human influx to the sources of supply is at the base of wasted time.

Difficulties related to the drinking water supply time:
Households travel 3 to 4 km, sometimes more, before reaching the supply points. In fact, during the dry season, some leave Béthel Motel to obtain water that SODECO qualifies as safe. The others go to neighboring villages like Ogoudakpo, Thio, Zaffé, Cabolé, and others.

In addition, once arrived at the water supply point, the influx of men and women there forces you to spend several hours waiting for water (Table IV). At certain times of the day, it takes 5 hours, 7 hours or even 10 hours of patience before having 8 water cans of 25 liters or a barrel of water (Table IV), Survey results, March 2010.

Table IV:- Average time lost to have drinking water.

Distance traveled (m)	Average number of households	Canister lost time (mn)	Time for filling a can (min)		Number of containers transported / day
			Min	Max	

Less than 100	37	60 -180	6	15	1258
100; 300	11	60-180	7	20	280.5
300-500	9	60-180	8	20	117
500-700	19	60-180	6	20	541.5
700-900	1	60-180	8	20	2
900-1100	13	60-180	7	20	247
1100-1300	2	60-180	4	20	4
1300-1500	0	60-180	-	-	-
1500-1700	7	60-180	4	20	70
1700-1900	0	60-180	-	-	-
1900-2100	6	60-180	5	20	102
2100-2300	0	60-180	-	-	-
2300-2500	0	60-180	-	-	-
2500-2700	2	60-180	5	20	7
2700-2900	0	60-180	-	-	-
2900 and +	3	60-180	5	20	15
Total	110	-	-	-	-

Source: Field data, October 2019

Table IV shows the distances traveled and the time lost by the populations to have a minimum of water container. The minimum distance traveled is less than 100 m and more than 2900 m at the most and the minimum time 60 minutes and 180 minutes for a container of water.

The order of arrival is required at all supply points; which would be violated by stubborn people.

Students and apprentices sometimes miss lessons or workshops for half a day in search of water, without which, man can do nothing. This continues to cost them dearly for failed question marks or referrals for reasons of absence from class. All this forces the populations to be satisfied with waters of dubious nature.

“Sometimes, to take water, I miss lessons and I also miss questions. It is because of this that I took up the 4th. Sincerely we are suffering for the water business there. You have to travel kilometers before you get water ”[Extract from an interview with AP, 3rd year student, 17 years old].

Difficulties related to the cost of water and SONEB subscription fees:
The sale of water is a determining factor in the sustainable management of drinking water supply structures.

In the commune of Glazoué, water is sold everywhere except water from modern large-diameter wells (Ahossouto) which is free.

The price of a 25 liter water container varies according to the quality of the water or the type of supply point and whether it is in the rainy or dry season. In fact, the water from SODECO, which cost 5 F per container, rose to 10 F. That from other boreholes (pumps) varies between 10 F and 15 F per container. As for that of Soneb, it costs 25 F or even 50 F per 25-liter can, but 10 F for subscribers, result of field survey, October 2019.

In addition, the payment of used water bills is becoming an ordeal for some households that wasted water such as that of rivers and backwaters.

“You know, other people use the water however they want, forgetting that they are going to pay at the end of the month. When the bill arrives, they refuse to pay the amount is too much ”. [Extract from interview with PL, Soneb agent, 34 years old].

After deleting a line, others refer without delay to other sources deemed incorrect. Likewise during the rainy season, the bills are almost worthless to other households. In other words, these households hardly use water from the Soneb during the rainy period. Fundamental and awareness-raising work is required for the population. Some people

undoubtedly qualify, as drinkable, water according to its physical aspect with its pleasant taste (especially in remote villages). But the bacteriological aspect is neglected in the latter.

Quality of water consumed by the population:
Water must meet a number of criteria or international standards before it can be qualified as drinkable.

Physical criteria:
They include temperature, turbidity, odor, color and taste. According to A. Kpasselokohinto (1995), cool water is more palatable than lukewarm water; moreover, drinking water must be clear and limpid. It must be colorless, odorless and have a pleasant taste. Turbidity is noticeable when the water is cloudy. Color, odor and flavor depend on the nature of the soil, plant and organic debris, the presence of certain micro-organisms and certain chemical substances in the water.

Chemical criteria:
The insufficiency or excess of chemical elements in drinking water has an unfavorable consequence on health. According to MF Comlanvi (1994), the excess of mineral salts can constitute a limiting factor on the quality of the water. Likewise, the lack of certain chemicals like iodine can drastically affect water quality. For MS Metahri (2002), drinking water must be free from all toxic substances (nitrate, ammonia, nitrogen pesticides).

Microbiological criteria:
The presence of fecal coliforms in the water means that the water is contaminated with feces. This fecal contamination is confirmed by testing for faecal streptococci. The existence of different germs in drinking water testifies to contamination of faecal origin. The relationships between drinking water quality and its determinants are listed in the conceptual framework.

Conceptual frame:
The relationships between well water quality and its determinants are listed in the conceptual framework in Figure 1:

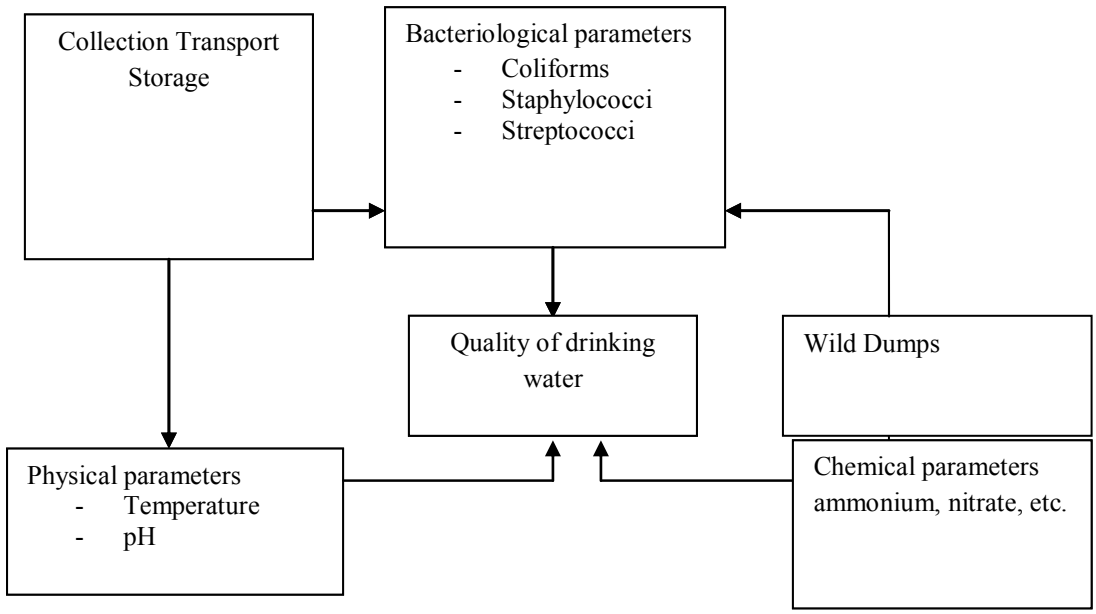

Figure 1:- Diagram of the relationship between well water quality and its determinants
Source: Field data, October 2019

Figure 1 shows the path of the water from the collection point to the point of consumption. Indeed, the water, after collection is transported before being stored. During this time certain bacteriological (Coliforms, streptococci, etc.), chemical (ammonium, etc.) parameters and atmospheric elements gain the water and thus condition the quality of the latter.

Water analysis results:
Taking international standards into account, a water sample from the SODECO borehole was analyzed (Table V).

Board V:- Result of bacteriological analysis of SODECO borehole water, 2010.

Settings				**Sampling reference and results**
Designation	**Unit**	**NG**	**VMP**	
Collection location	-	-	-	Glazoué Ayédèro / Drilling of the SODECO plant (formerly SONAPRA)
Nature of the sample	-	-	-	Raw groundwater
Date and time of collection	-	-	-	05/24/10 at 1:30 p.m.
Count of common germs in 48 hours at 37 ° C	CFU / ml	0	20: Disinfected water 50 Non-disinfected water	Innumerable
Presumptive research for coliforms	Positive or negative	Negative	Negative	Positive
Enumeration of total coliforms in 48 hours at 37 ° C	UFC100ml	0	0	Innumerable
Enumeration of Escherichia coli in 48 hours at 44 ° C	UFC100ml	**0**	0	0
Enumeration of faecal streptococci in 48 hours at 37 ° C	UFC100ml	0	0	29
Enumeration of sulfite-reducing clostridiums in 48h at 46 ° C	UFC20ml	0	0: E disinfected 2: Non-disinfected water	01
Conclusion	-	Healthy water	Healthy water	Contaminated water

NG: Guide level. VMP: Maximum Allowable Value. UFC: Colony Format Unit
Source: Central water analysis laboratory in Vèdoko / Cotonou, 2010

Analysis of the table reveals unexpected results. Indeed, there are coliforms in the water and the rate of these coliforms in 48 hours at 27 ° C is innumerable. The rate of faecal streptococci in 48 hours at 37 ° C has greatly exceeded the universal standard (29> 0). Likewise, as for the rate of sulfito-reducing clostridium in 48 hours at 46 ° C exceeds the standard provided for disinfected water (1> 0), only the rate of Escherichia coli remains normal to the expected standard.

Several factors could explain this pollution such as the absence of a system for collecting, treating and disposing of household refuse. In fact, solid and liquid waste is left in the immediate environment of homes. It is easy to see that household waste is thrown in a mixed state around houses and on garbage heaps and even in the immediate environment of supply points.

One of the sanitation measures often recommended to reduce the risk of water contamination by human waste is through the construction of public or private latrines.

But in the commune of Glazoué, latrines do not represent an imperative need for the populations although their usefulness is not disputed. The surveys revealed that the use of latrines is not systematic even where they exist, especially in dwellings located on the outskirts of towns. This is the basis of several diseases including the population of Glazoué.

Health problems related to water quality:
The quality of water is responsible for several diseases from which the population suffers.

It constitutes the fundamental element which conditions the existence of man in an environment. It remains an essential factor in maintaining health and the harmony of organic functions. Thus, any consumption of non-potable water is often a source of several water-borne diseases (L. Odoulami, 1999).

Water-borne diseases and their consequences:
In recent years, with the fight against dracunculiasis, still called Guinea worm, which has caused so much damage to humanity in this town, we are now witnessing other equally serious water-borne diseases. Among them, we can cite: gastroenteritis, typhoid fever, febrile diarrhea, dysentery, etc. (CCS de Glazoué, 2019). Table VI gives us more details.

Table VI:- Annual statistics of water-borne diseases in the commune of Glazoué.

Locality	Poliomyelitis	Yellow fever	Cholera	Bacillary dysentery0	Other diarrheal diseases	Other intestinal disorders	Malaria
Glazoué and Zaffé	0	0	5	344	472	1081	5232
Aklampa				200	193	1372	3747
Gome				33	41	123	956
Sokpota				18	58	192	865
Assanté				31	19	303	835
Thio				18	64	164	562
Magoumi				28	133	127	670
Ouèdèmè				60	82	175	1451

Source: CCS de Glazoué, October 2019

Table VI shows multiple water-related diseases recorded in all the districts of the commune of Glazoué. There is an increase in the number of patients in the districts of Glazoué, Zaffé and Aklampa where the infrastructure is insufficient (CCS Glazoué, October 2019).

Other problems:
More than 60% of those questioned estimated that drinking water points are far from their homes and generate long queues. In almost all the villages, people have to travel more than 5,000 meters to obtain water. Faced with this situation, the use of traditional sources is almost generalized during the period of agricultural work because the villages move all day in the fields.

The insufficiency of water points and the pressure on them considerably reduce the volumes of water consumed by the population.

In addition, we sometimes see discussions, quarrels and fights. Indeed, the non-respect of the order of arrival generates skirmishes between the youth especially. These quarrels or fights never cease to leave these scars on individuals and on society. They give rise to situations of mistrust with these consequences. Sometimes children are pressured to disobey parents' instructions or forbidden.

It emerges from all of the above that the municipality of Glazoué is a locality of attraction given its geographical position and some socio-economic assets such as the SODECO factory, the General Secondary Education College, the market international " Gbomina " which comes alive every Wednesday, and the availability of arable land.

However, the populations encounter enough difficulties in obtaining sufficient water of good quality. In addition, the character of rural life and the lack of information lead them to be content with polluted water not suitable for consumption. They are therefore exposed to various water-borne diseases with their consequences.

Likewise, the administrative slowness in the award of construction contracts prevents the timely execution of projects; the total non-consumption (100%) of aid made available to local communities by donors.

Recommended measures:-

To lessen the suffering of the populations of Glazoué in terms of drinking water supply, it is not only necessary to become aware of the present situation thanks to awareness sessions but more efforts or concrete actions at the level of development actors. .

To this end, it was noted some techniques, strategies and proposals for actions from a development perspective.

The treatment of drinking water is defined as the set of physical, chemical and biological transformations which aim to completely rid the water of unwanted bodies it contains to make it drinkable. This treatment falls within the competence of structures such as Soneb, DHAB, DH, etc. Generally, there are two methods of treatment.

Traditional methodsused include settling and boiling. Both of these methods are common in the research community.

By decantation:

The water is allowed to stand for a few hours in a container; the waste is deposited at the bottom of the container and the water is then collected without waste. The water collected is not yet pure even if it is clearer. To accelerate settling, we add alumina sulfate (alum Al2SO4) to the water we want to settle, (MS Metahri, 2012).

Example: take the capsule flush with arum for 30 liters of water.

Boiling:

Is also practiced by users of water points in the study area . It consists of boiling water. Most of the pathogens are destroyed. But boiled water no longer contains oxygen and has an unpleasant taste, COX (1967).

Among modern methods, wegenerally distinguishes:

Filtration:

It consists in passing the supernatant through a filter. It is only effective if the mesh of the filter is very fine. By filtering the water, it is made less dangerous.

As a filter, you can have: a sieve, a clean cloth, or sand + charcoal + gravel, a synthetic filter… and others.

Filtered water is not always drinkable, because the filters can leave some microbes, (MA Bezziou, 2013).

These populations use different methods of disinfection.They consist in completely removing the microorganisms present in the drinking water. We distinguish :

The use of iodine:

1. in a liter of clear water, you need 2 drops of 2% iodine
2. Forvery polluted water, add 4 drops of 2% iodine, (MA Bezziou, 2013).

Ozonization:

It consists of bubbling gaseous ozone in filtered water.

Ozone (O3) is a very strong oxidant. It destroys microorganisms by oxidation contained in water (GM Clégbaza, 2010).

Chlorination:

Chlorine, a very active oxidant, reacts with organic and inorganic materials in water. It is a chemical product whose bactericidal action ensures the best protection of water.

Disinfection by bleach:
After decanting and filtering, we put the bleach to destroy the pathogens contained in the water. In Glazoué, according to the results of an investigation at Soneb, bleach or calcium hypochlorite is used in the treatment of running water. Thus treated with bleach at 12 ° C it can be consumed after 30 minutes (GM Clégbaza, 2010).

Well disinfection:
It is usually done with bleach. In Glazoué, it is the hygiene officers who help the management committees to treat the wells. Depending on the quantity and quality of the well water, we dose bleach or calcium hypochlorite. But the most effective method of disinfecting wells is continuous chlorination using a diffuser pot. The diffuser pot is an autonomous device allowing chlorine to be released permanently in a well. However, the well must undergo pretreatment.

Conclusion:-

At the end of this research on drinking water supply methods in the town of Glazoué, several essential parameters emerge that allow us to better understand the water problems that arise. Analysis of the situation of drinking water supply methods in the research area shows that the situation is alarming on two levels.

The poor quality of the water due to bad behavior relating to the hygiene and sanitation of the populations on the one hand and on the other hand, the hydrogeological conditions specific to the area.

Indeed, apart from the relatively satisfactory rainfall (900 to 1400 mm per year), the populations of Glazoué are faced with a water deficit, in this case during the dry season.

Most wells dry up during the dry season and thus expose populations to the risk of water contamination due to the fact that the water from these types of wells is filled with sand and microorganisms.

As for modern wells and boreholes, poor management is the main cause of their abandonment. All situations that predispose people to resort to water sources of questionable quality.

Many individuals are victims of water-borne diseases such as chronic diarrhea, especially in infants, children and adolescents. Likewise, the low purchasing power of the populations does not allow them to obtain drinking water (on average 100 francs per day per household).

The most alarming situation is the lack of health education (lack of hygiene and sanitation agents) and awareness in order to allow populations to benefit from a clean environment to avoid small opportunistic diseases.

In view of all the above, we can safely say that the problem of drinking water supply, far from being a problem specific to the town of Glazoué, is a problem known worldwide.

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