

PROBLEM OF THE EXTENSION OF THE DRINKING WATER DISTRIBUTION NETWORK IN THE PERIPHERAL DISTRICTS OF THE CITY OF KISANGANI

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<https://doi.org/10.37602/IJREHC.2025.6416>

ABSTRACT

Access to clean water is an important issue in the world, as a man can go days without food and electricity, but it is impossible to go more than a day without drinking water. It should be noted that access to drinking water and sanitation services are essential to life. It is now recommended or a fundamental human right, it is part of the Millennium Development Goals, adopted by 189 member countries of the United Nations and whose objective was to reduce the percentage of the population that does not have sustainable access to drinking water and sanitation. The outlying districts of the city of Kisangani in the Democratic Republic of Congo are the main target of this article. Microbiological contamination of drinking water can cause the transmission of diseases such as diarrhoea, cholera, dysentery, typhoid fever and poliomyelitis and is estimated to cause 505 000 deaths from diarrhoeal diseases each year (13 Sept 2023).

Keywords: Problem, Extension, Distribution Network, Drinking Water and Peripheral

1.0 INTRODUCTION

Access to clean water is one of the main challenges of the 21st Century. Nowadays, more than a billion people in the world do not have access to drinking water, resulting in the death of more than 10,000 people per day, the vast majority of whom are children, despite efforts in terms of sanitation and drinking water supply.

It should be noted that the level of water supply to the population in the Democratic Republic of Congo is still insufficient at the present time. It is even worse in peripheral areas of large urban centres or in rural areas.

It is intellectually honest to unfortunately state that in the DRC, in the 21st Century, the only state company, which serves to distribute drinking water, is not able to supply the entire

population of the city of Kisangani, and more dangerously those who live on the outskirts of the latter, whose population still resorts to untreated borehole water, water from wells, rainfall, rivers, sometimes even polluted springs.

Indeed, our sites which are the subject of our article are not supplied with water from REGIDESO, which is why this population gets water from the springs of water points, undeveloped, not far from their homes, untreated water causing several waterborne diseases such as: diarrhea, cholera, typhoid fever etc.

The paradox lies in the abundance of water resources in this country, the DRC, has more than 50% of the water reserves of the African continent, but despite this natural wealth, drinking water remains a scarce commodity for the Congolese population in general and particularly those on the outskirts of the city of Kisangani, mainly due to the lack of infrastructure (15 Nov 2023).

Although the Democratic Republic of Congo (DRC) is the country with the most important water resources in Africa, it is now facing an acute crisis in the supply of drinking water. Indeed, only 26 percent of the Congolese population has access to safe drinking water, an estimate well below the average of 60 percent for sub-Saharan Africa as a whole. Due to damaged infrastructure, weakened by years of underinvestment and conflict, and rapid population growth, the coverage rate of water supply has declined until recently. The social and health consequences of the disruption of water services have been considerable. The poorest segments of society have been disproportionately affected by the decline in service delivery and rising water prices. This situation has been observed in rural areas but also increasingly in cities experiencing strong expansion.

Despite the complexity of the post-conflict situation, strong political will and international assistance have generated positive momentum in the water sector today. Thus, since 2004, the DRC has succeeded in halting the phenomenon of declining access to water and then reversing it. Gradually the trend, the efforts that have led to this important success deserve to be recognized and supported. Despite this encouraging turnaround, current forecasts indicate that even in the best-case scenarios, the DRC will not be able to achieve the Millennium Development Goals (MDGs).

In the DRC's fragile administrative context, the lack of effective control over the development of the territory represents a fundamental threat to strategic sources of drinking water. Poor land-use planning and inadequate protection of water sources at all sources, from villages or hinterlands from large cities to catchment areas of water treatment plants, affect progress towards the achievement of the MDGs.

As years of conflict have led to the gradual decay of public capacity, the administration of water services in peripheral, rural, and peri-urban areas has now become largely informal and no longer subject to independent oversight. Due to the overall lack of technical expertise of the various actors in urban and peri-urban areas, the quality of water supply structures and their maintenance have been compromised, with serious consequences for public health. In accordance with the laws on decentralization and the reform of public enterprises, a large-scale institutional restructuring is provided for in the preliminary draft law on water code.

While it is important to develop large-scale water infrastructure in the DRC, the implementation of small-scale projects often reaches a larger number of beneficiaries and produces better results per unit of investment. On the one hand, innovative strategies such as autonomous water service systems articulated at the community level or low-cost technical solutions such as standpipes, spring boxes or springs, hand pumps, supported by a variety of development partners (CTB, kfW, UNICEF) are all promising avenues. Others, through the World Bank's support to the public water service (RESIDESO), should help and revitalize large-scale water infrastructure. As for the governance of the water sector, the reform project supported by the GTZ as well as the preliminary draft law on the water code should help create the enabling conditions for social economy organizations, and help mobilize essential resources.

Today, it is necessary to embrace a broad horizon by exploring a mix of small- and large-scale solutions in order to develop and scale up positive initiatives into large-scale national programmes. At the same time, the establishment of a comprehensive national water information system is equally important, especially for the development of key economic sectors.

The DRC's abundant water resources are a major asset for the country's development. The challenges in the water sector are significant but not insurmountable. These could be overcome by the deployment of targeted investments and the reform of the sector's governance. (OCHA, 2011).

Access to clean water is much more than just a commodity, it is a necessity that shapes the daily lives of millions of people around the world. A vast country on the African continent, the Democratic Republic of Congo is one of the countries in the world with some of the lowest water supply and sanitation rates in the world and has declined over the past 20 years. According to the latest statistics, currently, only 26% of the population has access to drinking water and an adequate sanitation system, respectively. Low rates of drinking water coverage have led to a public health situation where diarrhoea causes 12% of deaths in Congo. The morbidity rate related to diarrhoea for children under five years of age in two weeks has reached 20% and epidemic diseases linked to water and sanitation, including cholera, continue to wreak havoc on the population. (Ntembwe Muambi, 2013).

The problem of lack of drinking water supply in the outskirts or slums of the city of Kisangani, raises concerns and questions, for any mind attached to a humanitarian concern, because this situation persists and creates uncertainty among the population, given a high number of infant deaths, related to waterborne diseases and other dirty hand diseases such as: typhoid fever, and cholera.

Faced with the situation in which this population on the outskirts or shantytowns of the city of Kisangani finds itself, which is abandoned, to their sad fate, our concern revolves around the following questions:

- What are the means and strategies put in place to supply these sites with drinking water?
- What is the policy put in place by the government of the DRC for the coverage of drinking water throughout the national territory?

The problem of access to drinking water in the outskirts of the city of Kisangani can be explained by several factors, namely: aging and insufficient infrastructure. REGIDESO (national water company), are old, poorly maintained and often undersized in relation to the growth of the population. Some peripheral areas such as Lubuya Bera are not connected to the grid. The lack of public investment, low funding from the Congolese state in basic infrastructure (capture, treatment, distribution).

3.0 METHODOLOGICAL FRAMEWORK

In the framework of this Article, we have made use of the structural-functional method and the systemic approach. They were supported by the documentary technique, and the free interview, direct observation disengaged and our sample was made up of the populations who live in the peripheries or slums of the city of Kisangani, namely Lubuya-bera which is an urban-rural sector community, with seventeen (17) localities namely: Zoo, Lindu, Alibuku, Tshopo, Ngenengene, Sim-sim, Lisombo, Bangboka, Kamaolo, Mangina, Ngbandia I, and Ngbandia II, which make up the Bakumu-Lubuya-bera grouping and other localities such as: Osio, Kubagu, Lula malinda and Batiangulu which make up the Lengola - Beda group, the choice was due, because of the high population density.

We were also interested in the technique of non-probability sampling with purposive choice. In order to make the data collected more intelligible, we have used two methods:

- Concerning on the one hand the data collected by documentary survey or by open question and on the other hand by closed questions;
- In order to derive the numbers from which we calculated the percentages according to the formula: $P=f/N \times 100$, of which P = percentage, F = frequency of occurrence of the response and N = total number of frequencies or distribution.

4.0 CAUSES AND CONSEQUENCES OF DRINKING WATER SHORTAGE IN THE OUTSKIRTS OF THE CITY OF KISANGANI

Water is a colorless liquid body under atmospheric pressure from 00 to 1000. Its chemical formula is H₂O (George and Verger 2009, p 137).

A shortage of drinking water can have different causes, e.g. drought, pollution, peaks in water consumption, blackouts, etc. Increasing population density and concretization may aggravate this problem (13, Sept 2023). This concept refers to water in its three main types for use by the population in an urban and peri-urban agglomeration, namely runoff, wastewater and drinking water.

In Chad, drinking water refers to any water intended for drinking and domestic use, the manufacture of carbonated beverages, mineral water and ice, and the preparation and preservation of all foodstuffs and goods intended for human consumption (Republic of Chad, Law No. 16/PR/1999, Article 2).

Freshwater is an essential resource for life, yet its unequal distribution is leading to critical shortages in many parts of the world. The causes of water scarcity are manifold, ranging from population growth and climate change to pollution of freshwater sources.

4.1 The consequences are dramatic

Degradation of ecosystems, impact on public health through the spread of waterborne diseases such as cholera, hindrance to economic development by limiting agricultural production and threatening food security. Children who are rescued are burdened with fetching water, have their education interrupted and are exposed to the risk of violence. Social and political tensions are also worsening, pushing some people to leave their land.

Access to water, crucial for development, is one of the first problems to be solved. By providing access to drinking water, we also improve the nutrition of families, the development of crops, their health, less waterborne diseases, the education and protection of children, not to mention hygiene and sanitation, we cannot separate water from hygiene and sanitation.

Fresh water, the only water that can be consumed, is a resource that is present on a global scale enough to meet the needs of the entire world population. However, the distribution of this drinking water is unequal and some regions are running out of this precious resource: for example, the peripheral environment of the city of Kisangani which suffers from it because of a shortage of drinking water in their environment, while the city of Kisangani is surrounded by rivers, but unfortunately the population is experiencing a serious problem of drinking water shortage.

According to the World Health Organization (WHO), water stress is declared when water availability is less than 1700 m³ per year per capita. When this threshold is between 1700 m³ and 1000 m³, it is more precisely referred to as water scarcity.

The causes of water shortages around the world are numerous. In some countries, population growth is putting pressure on water resources. The number of inhabitants is increasing, but the quantity of water remains stable or even decreases. The effects of climate change, such as more intense droughts and ecosystem degradation, are also aggravating already critical situations. Fresh water is also sometimes polluted, making its use dangerous and further reducing the available reserves.

Excessive groundwater expansion and unsustainable use of surface waters, such as rivers and lakes, are depleting water sources faster than they can be replenished. In addition, contamination of source water from industrial effluents, agricultural runoff, and inadequate wastewater treatment poses a significant threat to available water resources. Polluted water becomes unfit for consumption and further exacerbates water scarcity problems. (2023, May 11).

The consequences of water scarcity are manifold and can have serious repercussions on societies, economies and ecosystems. The lack of access to drinking water has serious consequences for the health of the population. Every year, 842,000 people die from diarrhoea due to unsafe water consumption or poor sanitation practices. 80% of diseases in developing countries are due to unsafe water and/or sanitation systems, and one in four deaths of children under the age of five is due to water-related diseases. (2019).

Per capita water consumption varies widely around the world, with an American needing an average of 500 litres of water per day, a Western European 150 litres per day and an African

only 50 litres of water per day. Although these differences tend to decrease over time, rural residents use less water than those living in cities. This is because young and old people use less water than average.

There are several factors to explain this disparity. The amount of water available is perhaps the most important factor, for example water is a precious commodity in Africa because it is scarce. Another factor is the price of water, the richer people are, the more they are able to consume a large amount of water.

To provide an answer to the question of how the management of the urban drinking water service contributes to promoting access to this resource by the inhabitants of the outskirts of the city of Kisangani, we use a hypothetico-deductive approach, based on deduction and reasoning. In the context of this article, the general theory that is verified in the particular situation of the periphery of the city of Kisangani is that access to drinking water is hampered by the way services are organized and managed (Jaglin 2001, p. 299) and that water is an indicator of socio-spatial inequalities (Fournier and Gouest 2004).

4.1.1 Pollution des sources

The Congo River and its nearby tributaries are polluted by domestic, industrial and agricultural waste. The lack of sanitation makes water sources vulnerable to contamination.

4.1.2 Unplanned population growth

The rapid urbanization of Kisangani and its outskirts has not been accompanied by a parallel development of water services. New neighbourhoods are developing without access to formal networks.

4.1.3 Poor management

Poor local water governance: diversions; Lack of regular maintenance.

4.1.4 Climatic and geographical factors

During the dry season, some springs diminish or disappear temporarily. The long distances between sources and homes complicate manual supply.

The massive use of well, river or borehole water, often untreated, exposing the population to waterborne diseases cholera, typhoid, intestinal worms (Radio okapi, 2025). In new housing estates such as Motumbe and Boyoma Plateau, they also suffer from a serious drinking water supply problem. Residents are facing inadequate bills, despite prolonged supply cuts (kis 24.info 2024). Entire neighbourhoods are deprived of REGIDESO's water, forcing residents to buy water at very high prices. (April 15, 2025).

4.1.5 Reinforced social inequalities.

Poor households cannot afford to pay for the water sold or to dig private wells. Wealthy neighbourhoods have access to better solutions, accentuating the gaps. Water is becoming a scarce and coveted resource, which deteriorates solidarity between neighbours or families.

Some families leave outlying areas to fetch water in the city, putting additional pressure on central neighbourhoods.

The authorities' failure to respond to this vital need fuels feelings of abandonment, marginalization and mistrust of institutions. These social dangers weaken the cohesion of communities and increase the vulnerability of already vulnerable groups, such as children, women or the elderly.

4.2 Opinion of respondents living in outlying districts of the city of Kisangani on the shortage of drinking water.

The inhabitants of the outlying districts of the city of Kisangani find a feeling of abandonment by the Congolese state. Water is life, they say, these inhabitants say that they are not considered Congolese. Many accuse provincial and national authorities of social injustice and negligence.

We get up at 4 a.m. to queue at the spring, women and children sometimes travel for miles with cans to look for water. Our children often get sick from well water.

Untreated water leads to typhoid, diarrhea, intestinal worms etc. All these lead to concerns for the health of the inhabitants of peripheral areas of the city of Kisangani.

This population also shows a feeling of dissatisfaction with REGIDESO, which sometimes sends bills, when there is no water simply because of having made a connection in certain neighborhoods that unfortunately does not even let a droplet of water flow.

This population, which is abandoned to their sad fate, resorts to survival solutions, it buys water from individuals, boreholes, artisanal wells, rainwater collection, rivers, these solutions are sometimes very expensive, precarious or unhealthy.

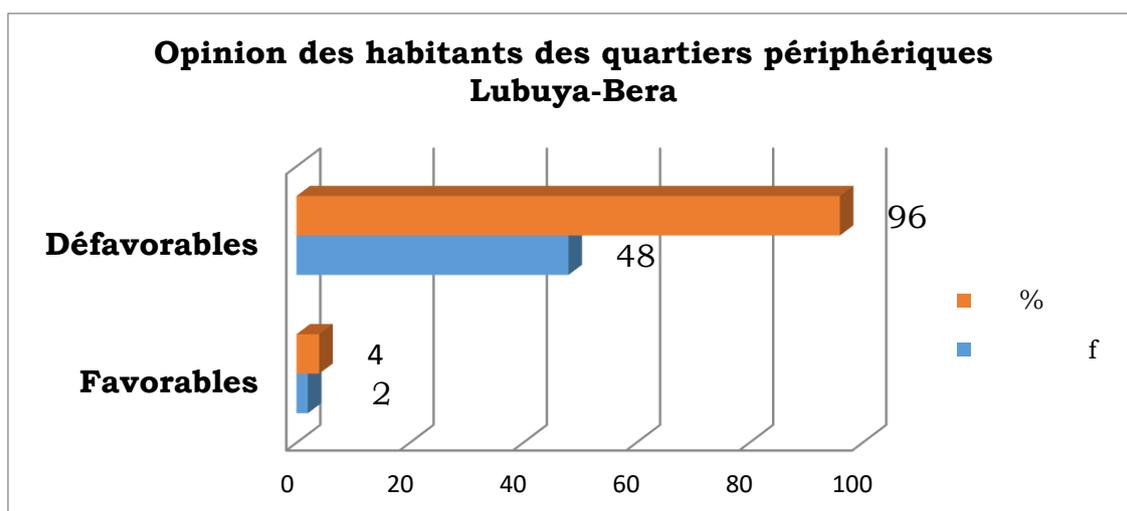


Figure 1. Opinion of the inhabitants of the Lubuya-Bera suburbs

It emerges from this table that the majority of the respondents, 48 or 96%, have an unfavourable opinion of the lack of drinking water in their environments. And 2 respondents, i.e. 4%, have a favourable opinion.

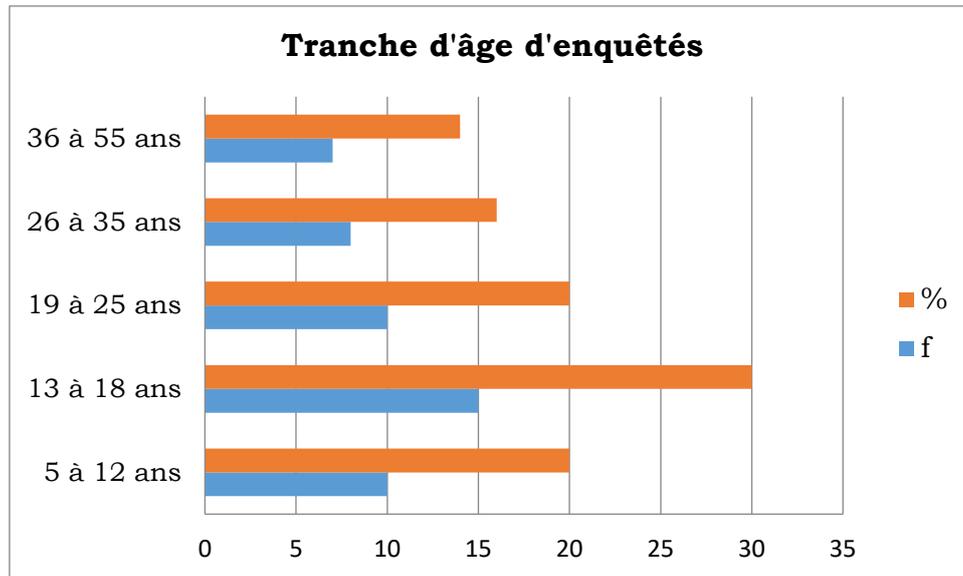


Figure 2. Age group of respondents

Considering the content of this figure, 15 subjects, or 30%, belong to the age group from 13 to 18 years old, 10 subjects, or 20% belong to the age group from 5 to 12 years old and from 19 to 25 years old, 8 subjects or 16% belong to the age group between 26 and 35 years old, 7 others, or 14%, for an age group of 36 to 55 years old.

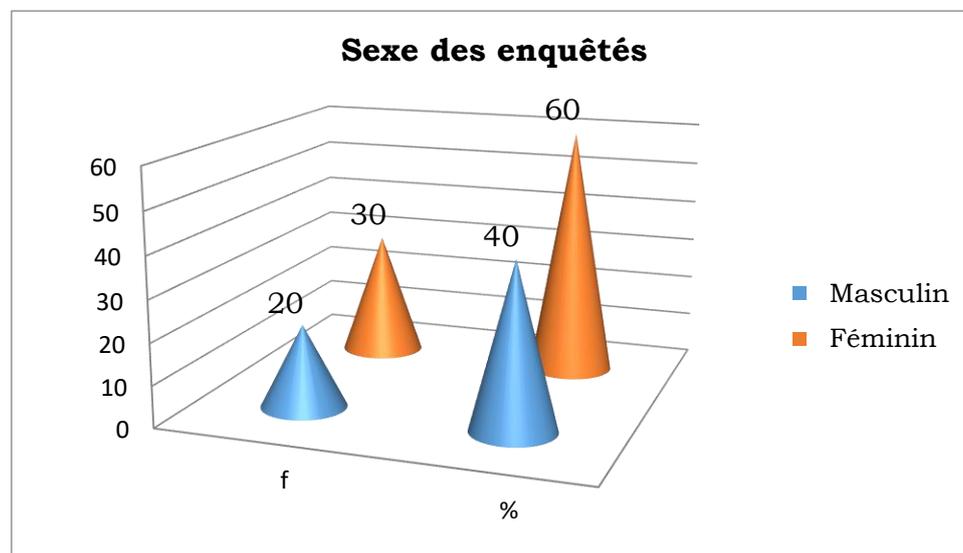


Figure 3. Gender of respondents

Taking into account the population of our study, we have in our sample 30 female subjects, i.e. 60%, and 20 subjects, i.e. 40% males, who are the subject of our research.

5.0 RESULTS AND DISCUSSIONS

Access to clean water is one of the main challenges of the 21st century, while the outskirts of the city of Kisangani are experiencing a serious problem due to the lack of extension of the

RESIDESO network, the peripheral districts of Lubuya-Bera are not connected to the central drinking water distribution network. There is a lack of investment in the widening of pipes to these areas.

The aging infrastructure of the current facilities dates in part from the colonial era. Leaks, breakdowns, and low treatment capacity reduce the amount of water available.

Rapid population growth and the peripheries are experiencing accelerated urbanization, without any support for public abuse. Demand far exceeds supply.

Poor management of REGIDESO, lack of maintenance, corruption, poor planning, lack of coordination between local and national authorities.

The lack of energy for pumping and frequent power cuts prevent the proper functioning of pumping stations.

Contamination from alternative sources such as wells, rivers and marshes are often the only sources available, but are exposed to pollution from waste, latrines.

Socially, the shortage of drinking water in the outskirts of the city of Kisangani generates several major dangers, namely: social conflicts and community tensions. These conflicts give rise to frequent disputes over scarce water points (springs, boreholes, wells).

Tensions between served and unserved neighbourhoods, or between families. There is exploitation of children and overburdening of parents, children, especially girls, are forced to travel long distances with water cans, to the detriment of their schooling. The women who are mainly responsible for fetching water suffer from physical exhaustion and daily stress.

According to the UN radio, Radio Okapi, the latest survey in the outlying districts of Lubuya-Bura, Plateau Boyoma, Kabondo, Mangobo, 78% of households say they do not have regular access to drinking water, 62% resort to unprotected wells or the river (radiokapi, 2025).

The outlying districts are not connected or suffer interruptions of more than 72 hours. The existing pipes are old, punctured or non-existent. The socio-health impact shows that a high prevalence of waterborne diseases, 46% of households according to radio okapi report frequent cases of diarrhea, typhoid and cholera. The authorities' failure to respond to this vital need fuels feelings of abandonment, marginalization and mistrust of institutions.

The unequal distribution of drinking water in the outlying districts is relegated to the background, thus creating a feeling of abandonment by the authorities, harming the legitimacy of the state. Water becomes a source of social tension, contested, a source of conflicts and local injustices. Women and children have suffered seriously, they face the arduousness and health risks associated with the collection of untreated water, also a failure of institutional responses, despite official speeches, the lack of maintenance, energy management and effective financing considerably limits access to drinking water in scrubbed areas of large cities.

The Democratic Republic of Congo, the contrast is striking, despite its abundant reserves of fresh water, the country remains one of the most poorly served countries in terms of access to drinking water, a real water paradox. The Democratic Republic of Congo has nearly 50% of

the water reserves of the African continent, the Congo River and multiple tributaries, yet access to drinking water remains very little limited, only 34% of the population benefits from a connection to the drinking water network in 2024, compared to barely 19% for electricity (Unicef.org:2023).

Drinking water supply rate 2024, 34% according to the Ministry of Water Resources in the DRC. The population served through REGIDESO in 2018, 25.4%, in 2023 35.5% of the population of the Democratic Republic of Congo (radiookapi.net:2024).

6.0 CONCLUSION

Natural abundance is not enough without adequate infrastructure. The country suffers from a lack of investment, poor management and massive losses due to leaks and poor maintenance.

Rural and peripheral areas are at a distinct disadvantage compared to city centres, such as Kisangani, exacerbating territorial marginalisation and social tensions.

The lack of clean water contributes to a high prevalence of waterborne diseases, affects children's schooling, which is a long and painful collection, and weighs particularly heavily on women, who are often responsible for fetching water.

The Democratic Republic of Congo accumulates resources, but without infrastructure, without sustainable political will, they remain inaccessible to a majority of its population, a striking paradox that poses a central challenge for the social, health and economic development of the country

This research highlights the deep inequalities in access to drinking water between the city centre and the outlying districts of Kisangani. Despite the abundance of natural water resources, populations living on the urban margins continue to suffer from chronic water scarcity, accentuated by the dilapidated infrastructure, the lack of extension of REGIDESO and deficient governance.

This situation generates not only serious health risks, but also social tensions, additional burdens for women and children, and a feeling of abandonment towards public institutions.

It is becoming urgent that the Congolese State, the local authorities and the technical partners implement a coherent policy of investment, maintenance and rehabilitation of the distribution network, including the peripheral areas as a priority.

Beyond a vital need, access to drinking water is a fundamental right and a lever for social justice, human dignity and sustainable development in the city of Kisangani and its peripheral areas, which are experiencing a serious problem of drinking water shortage.

REFERENCES

Fecht, S., (2019), how climate change impacts our Water.state of the planet.

Fournier I.M and Gouest V., (2004), "Drinking water and social inequalities in Latin American cities", in ESO, nO22-October 2014, pp.7-20

George, P. and Verger, F, (2009), Dictionnaire de la géographie, presses Universitaire de France, Paris.

Globalpressjournal.Com:africa/democratic-republic.of-congo/drc-vast-Water-resources-kisangani -taps-run-dry/fr?Utm-Source=Chatgpt.Com

[http //news.climate.columbia.edu/2019 /09/23 climate-Change-impact-Water;](http://news.climate.columbia.edu/2019/09/23/climate-Change-impact-Water/)

[http ://www.who.int](http://www.who.int)

[http ://www.banquemomeriala.org](http://www.banquemomeriala.org)

[http/fr.wikipedia.org/wiki/vegetation/Kisangani](http://fr.wikipedia.org/wiki/vegetation/Kisangani)

[http://www.ffl.Into.fr/environnement-ecologie/carte-secheresse-alerte-crise-vigilence-restrictions-d'eau-arrete-prefectoral-listepropluvia-2256563.html .](http://www.ffl.Into.fr/environnement-ecologie/carte-secheresse-alerte-crise-vigilence-restrictions-d'eau-arrete-prefectoral-listepropluvia-2256563.html)

[http//. www.informing humanitarians wofdwid a service provided by OCHA. \(Rapport technique\)](http://www.informinghumanitarians.org)

Jaglin S., (2001), "Drinking water in developing cities: market models in the face of poverty", Tiers-Monde, tome 42 n° 166, in, Meublat G(ed), Les nouvelles politiques de l'eau Jeux Urbains, ruraux et régionaux pp.275-303.

Kis 24 info, kisangani: severe water shortage in several districts.

Ntembue Muambi, C., (2013), The problem of water supply and its impact on waterborne diseases in the city of Mwene Ditu, Bachelor's thesis in public health, FMP, UNIKIS.

Water shortage, www.wordvision.fr

Radio Okapi, Report of many neighborhoods in Kisangani deprived of drinking water, Kisangani on February 17, 2025.

[Radiookapi.net .www.radio.net /2025 /02/17 news/society of many-neighborhood-of-kisangani-deprived-of-drinking-water,utm-source=chatgpt.Com.](http://radiookapi.net)

[Radiookapi.net:www.radiookapi.net/2024/07/19/actualite /company /DRC-the drinking-water-service-rate-rises 34-that of electricity? Utm-Source= Chatgpt.Com](http://radiookapi.net)

Republic of Chad, (1997), Urban Development Project in Chad; feasibility study Ministries of Public Works, Transport, Housing and Urban Planning and Group Eight, Final Report, Paris.

Unicef.org: [www.Unicef.Org/drcongo/what we-do/water-hygi% C3% A8 ne-and-sanitation?utm-source=chatgpt.com;](http://www.Unicef.Org/drcongo/what-we-do/water-hygi%C3%A8ne-and-sanitation?utm-source=chatgpt.com)

World Health organization (who) <https://www.int>

www.kis24info/Kisangani-strong-water-shortage-inseveral-districts/utm-source=Chatgpt.Com