



# Identification of the Problems Induced by the Informal Districts of the Commune of Ziguinchor (Senegal) and Analysis of their Social and Environmental Impacts

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## Research Article

Volume 3 Issue 1

Received Date: February 06, 2020

Published Date: March 25, 2020

DOI: 10.23880/oajwx-16000136

## Abstract

Ziguinchor, like the rest of African cities, has experienced rapid urbanization in this last years, determined by a strong demographic increase which is out of step with the urban planning capacities of the public authorities. That creates an expansion of informal districts. The creation and development of these informal districts are left to their own devices by the authorities, who refuse to condone the illegal occupation of the lands. These letters must resort to individual practices to face the problems of basic infrastructure, sanitation ... However, these unsuitable practices are sometimes likely to provide lasting solutions to the problems posed. They neither ensure an improvement of living conditions, but damage the environment of these neighborhoods. This article, based on the literary review, qualitative and quantitative surveys and interviews, aims to highlight the interactions between the problems induced by the informal districts of Ziguinchor city and their social and environmental consequences. The results show that informal districts suffer from a lack of public lighting, drinking water supply and sanitation; second, they reveal that the discharge of wastewater on the ground (90%) and the method of burning (87%) are the main methods for treating solid and liquid waste; and finally, they attest that physical and land insecurity, esthetic and olfactory nuisances as well as pollution of the groundwater are the impacts with which the populations of the informal districts are confronted.

**Keywords:** Informal housing; Social impacts; Environmental impacts; City; Ziguinchor

## Introduction

Housing needs in urban areas change with the population's natural growth and the rural migration. Senegal, like the other countries of the West African sub-region, has experienced a very fast and often poorly controlled urbanization process. This phenomenon is largely due to a migration of the population to urban centers. Its urban population is increasing quite dynamically: less than 2 million in 1976; 2,658,000 in 1988 and more than 4 million at the 2002 count out of a total of nearly 9,855,000

inhabitants [1], representing a urbanization rate of 47% in 2009 [2]. This extraordinarily rapid and uncontrolled rate of urbanization has led to the rapid development of cities with more than 10,000 inhabitants, going from 6 in 1955, 31 in 1981, 43 in 2002, 50 in 2007 and 116 in 2019 [1,3]. Unfortunately, this demographic advance hasn't gone with a significant growth in the economic and social sectors and has led to major problems in the housing sector [4,5]. Thus in the housing sector there is a rush of informal neighborhoods which cover large areas.

Ziguinchor city, geographical locality of our study area, is not saved from this situation. Indeed, the informal districts of Ziguinchor city constitutes concrete examples with a total absence of subdivision, which causes overcrowding and unhealthy conditions. In these districts, the housing is precarious with barracks, mud houses often coated with cement [4]. They are compound by unsanitary spaces where housing is low standing and overcrowded. Thus, these districts face a difficulty in accessing drinking water. Most of the family supply water from wells what does not go with the quality of drinking water according to the standards of the World Health Organization (WHO). The lack of an urban plan and the insecurity of land have facilitated the anarchic construction of informal housing, by not respecting town planning and sanitation rules. A large number of disadvantaged people has not benefited from a property development system that would allow them to live decently in normal housing. This ascertainment animates the process of informal construction in Ziguinchor which is very worrying) [4]. These districts are currently facing several problems which degrade their environment and make the future of their inhabitants vulnerable. Among these problems the most obvious are: the lack of collective public system of sanitation and the weakness of the service of household garbage collection causes deposits of garbage dunes near houses; frequent flooding in winter due to the lack of waterway and the lack of facilities at the sub-district level;

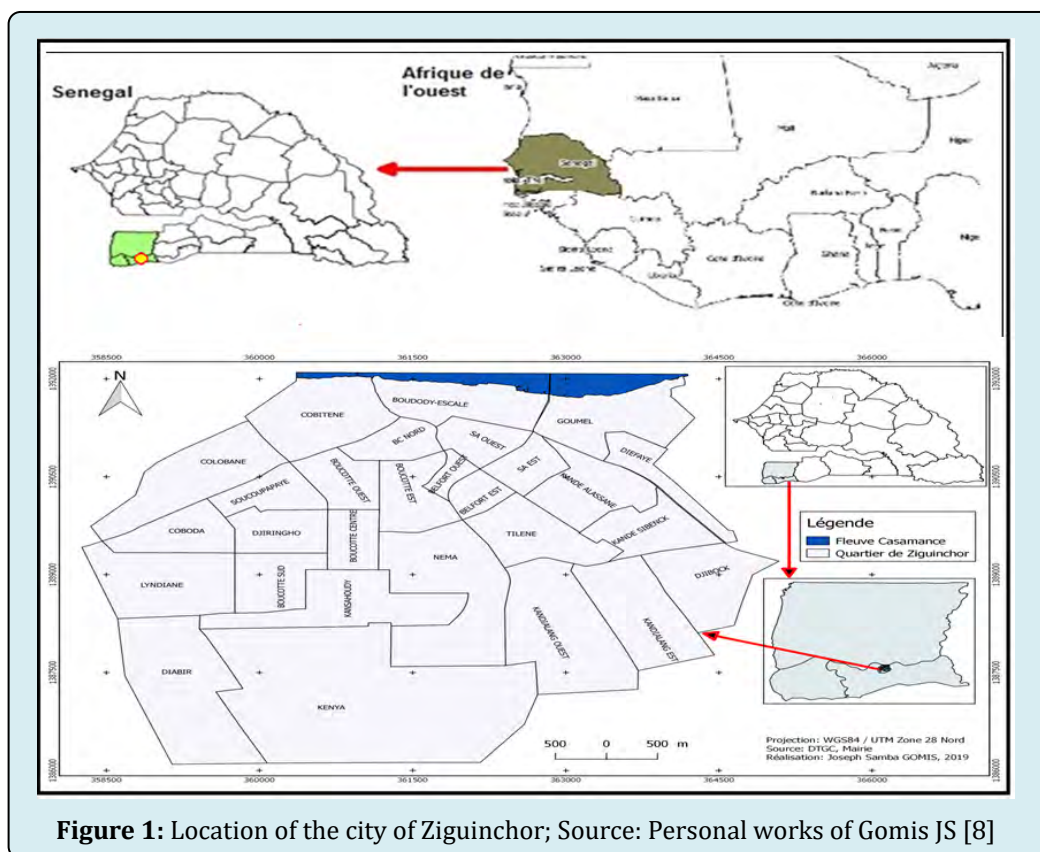
and the lack of a regular roads system causing huge mobility and security problems for residents.

Faced with this situation, the research questions underlying this study are the following: What are the matters caused by informal housing in Ziguinchor? How does the population behave face to these problems? What are the social and environmental impacts caused by these problems? This study and research work is set as the main to identify the problems caused by informal housing in Ziguinchor city and then analyze their social and environmental impacts. Finally, it tries to contribute to the reflection on the development of informal spaces in order to assess the shortcomings and strengthen the publications done.

## Methodology

## Presentation of the Study Area

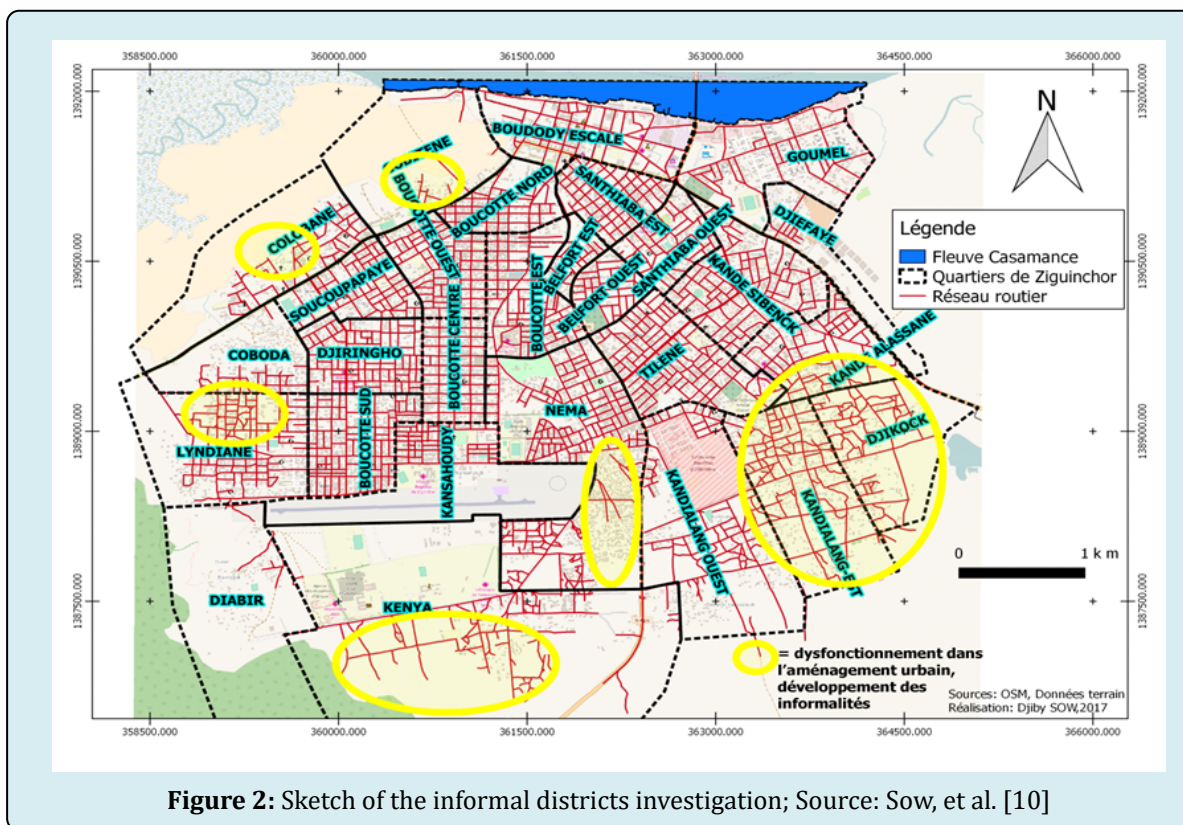
It faced an exponential urban growth since the 1970s, 1980s and 1990s with an urbanization rate of 51.1%. The municipality of Ziguinchor is the capital of the region. It is located between the meridian  $16^{\circ}$  and  $17^{\circ}$  and the parallels  $12^{\circ}$  and  $13^{\circ}$  and occupies an area of 4450 ha [6]. The city of Ziguinchor is located on the left coast of Casamance River 65 km from its mouth on the Atlantic Ocean (Figure 1).



Ziguinchor city was born at a point of extreme tightening of the Casamance estuary due to the advancement through the north of the southern lowlands. From there, is the last site downstream where the mainland is the closest to the muddy bank (if we exclude Pointe Saint Georges and Carabane which are former dune cords whose smallness does not permit a real urban creation) [7]. It is located in a basin bordered to the north by the Casamance River, to the south by the rural commune of Niaguis, to the west by the Djibélôr backwater and to the east by the Boutoute backwater.

## Materials and methods

Depending on the objectives set, we adopted a methodological approach which consisted in collecting quantitative and qualitative data through bibliographic research, field investigations and personalized interviews. This study was also based on a large documentary review and on socioeconomic, demographic and spatial data. These data are collected from families in informal districts respectively between January and June 2018 (Figure 2).



The data searched in the case of this study focused particularly on: the problems caused by the informality of these districts, the behavior of the populations face to these problems and finally on the social and environmental impacts. Taking the fact of lack of reliable and updated statistical data to make a reasoned choice survey, the random survey method was chosen. Using an aerial photograph of each of these 6 informal districts on Google Earth, we have been able to identify all the plots. The basic survey used is the step of 6 concessions. Totally 302 households were visited out of 5032 concessions. Thus, the different data collected, in particular quantitative data, are processed with Sphinx and Excel software. This software was used at the same time to calculate the frequencies, to make the tables and realize the graphics. We then used Google Earth and Quantum GIS to make the maps.

## Results and Discussions

## The Problem of Informal Districts in Ziguinchor Municipality

The informal districts in Ziguinchor city are seen by public authorities as spaces of spontaneous urbanization, areas consolidated on the fringes of legality, epicenters of marginality and pathological spaces [11,12]. Other authors consider the informal districts as an antithesis to the city. The city of Ziguinchor is surrounded by non-regulatory, in other words informal, districts [4]. These districts are built without respecting the town planning standards enacted, that's why they are called "anarchic districts" if we refer to the words of Valérie le Clerc. The staggering movement of these areas manifests itself in precariousness, overcrowding,

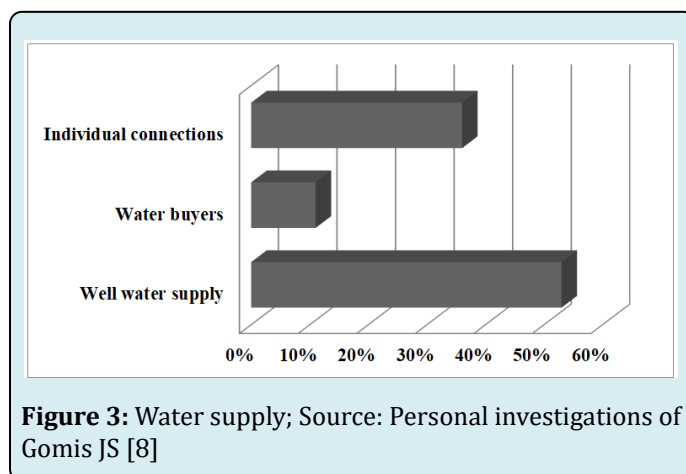


inaccessibility, unhealthiness, the discharge of wastewater, stagnation, wild discharge of garbage and especially floods in summer [3]. The major problems in these informal districts are the total under-equipment (absence or insufficiency of the drinking water supply network, electricity, roads, sanitary infrastructure, schools, markets ...), the conditions very advanced of insalubrity (heap of putrescible filth, proliferation of disease vectors such as flies, mosquitoes, rats, worms, cockroaches; stagnation of wastewater) and harsh living conditions (poverty, unemployment, insecurity...) [11]. These informal districts are generally built outside of urban and architectural rules with often low constructions, narrow streets, and adjoining buildings often without withdrawal from the lane. The houses in these informal districts form a group of buildings juxtaposed with each other, all along the cut alleyways. These districts are characterized demographically by high density in households or overcrowding of housing [3,4]. This fact completely changes the urban morphology of Ziguinchor, causing in this way an inconsistency in urban planning.

### Problems with the Lack of Lighting and Drinking Water Supply

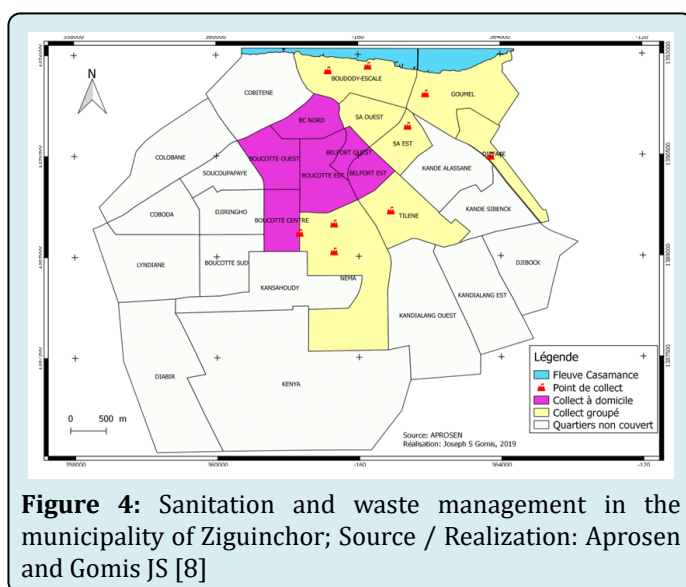
One of the major problems in the informal districts of Ziguinchor city is the lack of lighting. Field investigations have revealed that: 60% have electricity in their homes, but what needs to be understood is that in this high category of people with electricity, most households have internal connections. Meaning connections which are not declared to SENELEC, but which are made informally (between neighbors) with the main method of arrangement. In contrast, 40% have no electricity in their homes. They use storm lamps, candles and other. In addition, there is a deficiency of electric poles. The few streetlights that exist in these districts are not functional, causing a non-lighting of the streets. In addition to the problem of the lack of lighting, the informal districts of the city of Ziguinchor faced with problems of drinking water supply. They supplied with drinking water from the SDE, which is responsible for the distribution and marketing of water in Senegal. The water supply is either from individual connections, standpipes or wells (Figure 3). Thus, 36% of the households surveyed have an individual home connection; 11% of the households surveyed buy water either at the standpipes or at the wells. This part of the population buys water from the standpipe for consumption and cooking (the basin is 50f and the bucket 25f cfa). Therefore, to wash clothes, it buys water at the wells by paying monthly contribution of one thousand CFA francs. On the other hand, 53% of the households surveyed use well water to ensure their water consumption and satisfy their needs. These latter declare that they do not have sufficient financial resources to bear the supply costs at the standpipe. As a result, they dig wells on their plot and in most cases in front of their houses or in

the lane from which they draw water unfit for consumption.



### Sanitation problems in Informal Settlements

The informal districts are relatively well connected to the center of the city of Ziguinchor. However, circulation in these districts for cars remains almost impossible. Most of them are devoid of driveways. The traffic conditions are very worrying because of the narrowness of the alleys and their forms in winding mode. They constitute quagmires during the rainy season because of the site and the topographic profile, which explains the isolation and inaccessibility of these informal districts making them almost impossible to collect and evacuate solid and liquid waste with mechanical means (Figure 4).



Through this map, it is easy to see that the informal districts are not concerned by the different waste management policies. This lack of sanitation infrastructure

such as rainwater drainage canals, garbage bins, etc., lets the population be fully responsible for the management of solid and liquid waste. In this way, the populations are forced to initiate popular practices to make up for their needs. Faced to this situation, the only solution remains the discharge of wastewater and household waste on the ground (in the streets, vacant lots and alleys) [4]. In some concessions, we note the presence of holes intended to receive wastewater and at the same time constitute places for the deposit of household waste. As a result, this wastewater mixed with litter of all kinds and faeces pollute the environment of these informal districts. Thus, we note the presence of several puddles of water that strew the houses, especially in the summer period which is not good to see (Figure 5). This situation further increases the vulnerability of populations and exposes them to multiple health risks. There are also countless wild dumps of household garbage in each corner (Figure 6).



**Figure 5:** Stagnation of rainwater and domestic wastewater in Coboda

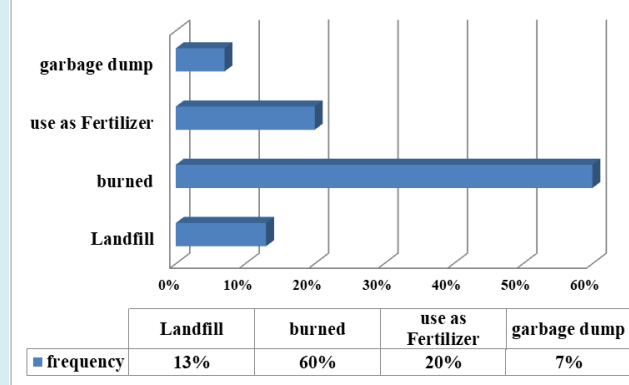
**Source:** Photo by Joseph Samba Gomis, Doctoral thesis in progress 2019



**Figure 6:** Household waste deposit in Néma 2.

**Source:** Photograph by Joseph Samba Gomis, master thesis UASZ.

In order to take care of the evacuation of their solid domestic waste, the populations of the informal districts of the city of Ziguinchor have implemented a whole system of voluntary pre-collection, and elimination of household waste (Figure 7).



**Figure 7:** Method of processing household waste; Source: Personal surveys JS [4].

Firing remains the main method of treatment applied to garbage, practiced by 60% of households, worse it is unfortunately often done without the object of any prior sorting of the various components (windows, glasses and metals) all goes there. Acetylene plastic objects, which are increasingly used, produce very black fumes and foul-smelling and toxic odors [4]. The extent of this firing practice is to be compared on the one hand, with the daily volume of waste produced of 7.2 tonnes / per day, or 0.63 kg / person / day and on the other hand with the frequency of waste evacuation [12].

### Social and Environmental Impacts of Informal Settlements

#### Social Impacts

- **Physical and land insecurity**

Informal housing has created a number of social consequences such as physical and land insecurity. We note that most of the population knows that informal districts face innumerable cases of insecurity. Thus, there are recurrent disputes between passengers and heads of families due to repetitive passages in the concessions, and even sometimes disputes between neighbors because of the non-delimitation of the concessions and all this constitute a form of insecurity in the case that people do not feel comfortable at home. A very large number of households do not have electricity, so at night without light in the streets, people face all kinds of insecurity. Talking about this fact, people are sorry for this insecurity which has prevailed for a very long time, because they are experiencing the anguish of an upsurge of violence

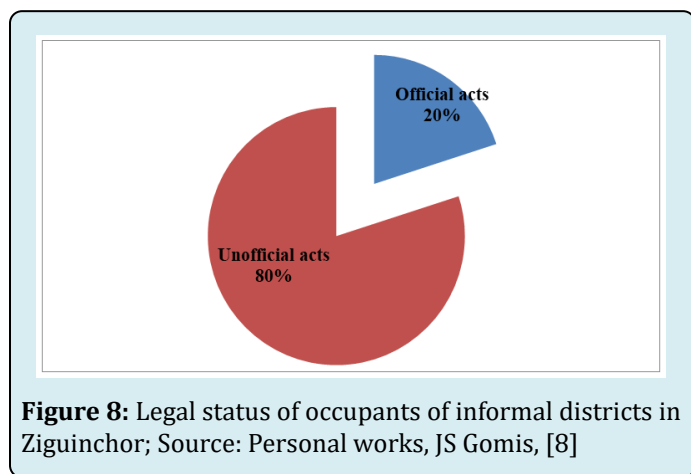
(Table 1). Everyday cases of a certain size are noted, and that make the populations be into a total psychosis [4]. The psychosis is so great that some people say they are afraid to go out after 10 p.m. because of the recursive attacks.

Most frequent cases of insecurity	Percentage
No answer	1,10%
Violence	40%
Rape	6%
Banditry	41,10%
Addiction	8,80%
other	3%
Total	100%

**Table 1:** Most frequent cases of insecurity.

**Source:** Personal investigations by Gomis JS [8]

In addition to physical insecurity, the issue of land insecurity is today a major problem in these informal neighborhoods. Almost all of the inhabitants of this sub-district live in fear because they do not have land titles, leases and permits to live (Figure 8).



**Figure 8:** Legal status of occupants of informal districts in Ziguinchor; Source: Personal works, JS Gomis, [8]

People know their land illegalities and the risk of eviction which they are exposed to, so they often build their homes out of mud and salvaged materials. This situation leads more to the precariousness of these districts with a lack of basic equipment and infrastructure. Nowadays even a few rare people who have had to get out of poverty do not have a decent home. These one do not have land title, live in precarious housing, this not because they haven't no money to access a decent house but because they do not have land title to be able to build an adequate house. Only a few of these people have made modern constructions, but without planning permission. Almost all of the occupants cannot fully enjoy their right to appropriate the land they occupy to the

point that people live in terror of losing their homes one day because these areas are legally illegal, only securing land can resolve this situation.

#### • Poverty and unemployment

Unemployment is the situation of an employee who is well suited to work and finds himself without a job [13]. More than half of the population of the informal settlements in the city of Ziguinchor lives in poverty. For example: a workforce of 70% of the populations of Néma 2 lives below the poverty line (100 dollars per month), therefore 30% of young workers and 40% of young workers, living in the sub-district of Néma 2 are at unemployment [14], and this constitutes an evil that undermines this sub-district. As a result, poverty persists in this disadvantaged sub-district; employment and unemployment are at the heart of the difficulties encountered by the populations. Unemployment in the informal districts nevertheless remains much higher than that observed in the other districts of the municipality of Ziguinchor. In these neighborhoods the unemployment rate reaches an alarming proportion, young people are the main affected: the proportion of unemployed young people is twice as large as elsewhere. In total, four out of five young people from informal neighborhoods are unemployed or inactive [3]. This high proportion of poor is explained by the fact that the majority of the inhabitants of this sub-district come from rural areas and is farmers, with no professional qualification, therefore there is the problem of integration. Poverty is sitting and getting worse day by day in these neighborhoods, as many families are struggling to meet their basic needs. Some would even believe themselves to be a state which, however, should provide them with the bare minimum. This compromising situation has led to deviant practices such as begging which has become a real case in this sub-district, to this is added the phenomenon of prostitution which today, with the extreme poverty of these informal districts and prolonged celibacy unemployment caused by young girls and boys led to this deviant practice which, even if it existed, was done with a certain discretion [4].

#### Environmental Impacts

##### • Aesthetic and olfactory nuisances

Aesthetic and olfactory nuisances. They are often the result of accumulations of wastewater in places very close to homes, thus offering a spectacle that is not very good to see (vast expanses of stagnant water, countless wild deposits next to houses, etc.). These aesthetic nuisances increase during the rainy season when runoff mixes with domestic sewage and household solid waste of all kinds, and invade the streets, vacant lots. The stagnation of rainwater or domestic wastewater and the wild dumping of household waste have favored the proliferation of insects in this sub-district but also of certain reptiles (lizards), frogs, without forgetting rodents. They go during the hot season with the



strong sunshine and the high temperatures, of releases of foul smells coming from the fermentation of organic matter and putrescible solid matter contained in the expanses of stagnant wastewater thus causing odor nuisances [10]. The piling up of garbage also causes aesthetic and olfactory nuisances often very badly supported by the occupants of these districts. Added to this is the appearance of greenery due to the fact that even in the dry season these areas are filled with grass due to the continuous stagnation of rainwater and domestic wastewater. The incineration of garbage piles causes the release of gases such as: hydrochloric acid (HCl), sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S) and phosphogen which are very harmful to humans. Likewise, inhaling smoke exposes populations to the risks of Acute Respiratory Infection (ARI), especially in children [4].

#### • Pollution of the Water Table

The informal districts of Ziguinchor city due to the lack of collective sanitation infrastructure can only constitute a home where the risks of pollution are high. This is mainly the pollution of the water table by infiltration of waste water and excreta, or even by the burial of household waste. Domestic and rainwater used contain large quantities of organic matter such as ammonia which mineralizes by nitrification and denitrification processes first transforms into nitrites and then into nitrates where its infiltration can lead to contamination in nitrate of the water table. These elements produced in informal areas marked by the absence of wastewater drainage channels, by the use of individual sanitation devices for sanitary equipment that do not meet urban planning standards, and finally deliberate practices burial of sewage in the ground and household waste can easily pollute the water table. Several factors have shown that there is a close link between poor waste management and pollution of the water table. Households which have their latrines inside their concessions do not respect a safety distance of at least 15m between the wells and these as it was said in article 9 of the hygiene code. This results in possible contamination of well water by latrine sludge, therefore the populations themselves have declared that the wells are polluted and the water has a poor quality often creating intestinal infections and diseases such as cholera. Thus a workforce of 75% of the population surveyed claims that well water is polluted and that 25% claims the opposite. It is important to emphasize that the possibility of pollution is much higher during the summer period, because it is during this period that sanitation reaches its peak in the streets with the dumping of waste from latrines and pits seep. In the soil thus polluting groundwater.

### Conclusion

The results of informal districts on the daily lives of populations remain visible their social and environmental

consequences are numerous. Taking the massive influx of populations into the cities, it is necessary to move towards sustainable cities able to be maintained over time, of maintaining an identity, a collective sense and dynamism in the long term. That's why that the article proposed to identify the problems of the informal districts in the city Ziguinchor while studying their social and environmental impacts. These districts are left to themselves by the authorities who refuse to condone de facto or de jure the illegal conditions of land use. Thus, the lack of servicing which results in the absence of support measures and basic infrastructure has impacted on the environment of informal settlements. However, the unsafe and unhygienic disposal of waste water and infected human faeces in the natural environment causing contamination of the soil and water sources; which causes the deterioration of the living environment to such an extent that one wonders about the future of the environment of the Néma 2 sub-district. It then becomes important to control the land tenure of the city of Ziguinchor, to proceed to restructuring operations. Especially since the impact of the informality of these districts cannot be overlooked. It is still important to set up a good communication strategy between the different actors involved in urban planning, and the populations.

### References

1. DPS (2007) Economic situation and urban population in Senegal. Senegal: ANSD.
2. ANDS (2014) Economic and social situation in the Ziguinchor region, Republic of Senegal, pp: 114.
3. Samba GJ, Djiby S, Oumar S (2019) Urban environment and health in the commune of Ziguinchor (Senegal): the example of the districts of Néma 2 and Coboda. *Revue de géographie du laboratoire Leidi*, pp: 280-295.
4. GOMIS JS (2014) Study of spontaneous habitat in the town of Ziguinchor: Néma 2 sub-district, Master thesis, Assane Seck University of Ziguinchor, Department of Geography, pp: 114.
5. Ibrahima B (2013) Local governance and the fight against poverty in the municipality of Ziguinchor: Role and involvement of actors in meeting local needs. »Master 2 thesis in geography. UCAD, FLSH, Department of Geography.
6. PIC (2012) Ziguinchor town hall, Ziguinchor commune municipal investment plan. Ziguinchor, pp: 112.
7. Omar SY, SANE T (2016) Peri-urbanization and vulnerability in the city of Ziguinchor (Senegal): the case of the Quartier de Goumel", UASZ, UFR Sciences et Technologies, pp: 11.

8. GOMIS JS (2019) Urban governance and informality in southern cities: the example of Ziguinchor in Senegal. Doctoral thesis in progress, UASZ, Department of Geography, UFR of Sciences and Technologies, pp: 357.
9. Samba GJ, SOWD J, Omar S (2019) Territorial Diagnosis and Urban Governance, an analysis based on the use of ICT (OSM, Geomatics). Cinq continents 9(20): 181-195.
10. SALL O (1998) Urban waters, Autonomous sanitation and Environment: the case of Medina Gounass (Guédiawaye), master's thesis UCAD, department of geography, pp: 105.
11. Soares RG (2016) What land regularization for Brazilian cities? Challenges and obstacles. Metropolitiques.eu, pp: 10.
12. DIEME JS (2007) Problem of household waste management in the municipality of Ziguinchor: management systems and environmental impacts. Master thesis, Faculty of Letters and Human Science, Department of Geography, UAD, pp: 97.
13. LAROUSSE (2009) Edition 9: 3.
14. UNICEF (2003) Poverty study on spontaneous neighborhoods, Report ID = 7097, West Africa, Senegal, pp: 78.

