
Implications of the Urban Expansion of Bohicon toward the District of Avogbanna (Republic of Benin)

TCHAOU Brice Sèvègni
University and Technical Institute of Lokossa, Benin.

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Abstract

This research aims to study the implications of the urban expansion of Bohicon toward the district of Avogbanna.

Data and information were collected through documentary research, direct observations, and interviews with wise people in Avogbanna District, with communal, local authorities and household surveys. The SWOT model (strengths / weaknesses / opportunities / threats) was used to analyze the results.

According to 89% of the respondents, the population settlement in the district is bound to its vicinity to the downtown area of Bohicon and to its location nearby the Inter-State way N°2. For 75% of the respondents, the district of Avogbanna is a little polluted calm medium where the rent is less expensive and the majority of the rooms are lately built and roomy. The number of people has doubled during the last decade years. It is noted that 45.76% of the respondents are active in the borough, of which 14.4% are teachers, 20.33% are craftsmen, 8.47% are shopkeepers and 1.69% are farmers. More than 60% of teachers and workers set in the district so as to get closer to their place of work. Consequently, the price of a parcel has tripled during four years in the district.

Keywords: Bohicon, Avogbanna, suburbanization, suburban space, urbanization.

Introduction

According to UNFPA (2007), 28.6% of the world's population live in cities and continue to increase at a very fast pace reaching 3.3 billion people in 2008, and by the year 2030.

Africa in general, and sub-Saharan Africa in particular, once considered basically rural, has not escaped the phenomenon of rapid urbanization even though it remains the least urbanized region in the world (M. D. Baloubi, 2009, p. 35). Thus, Benin is undergoing rapid urbanization like all African countries of south Sahara. The urbanization rate was only 16% in 1961, date of the first demographic survey in Benin. It rose to 26% in 1979 and 36% in 1992. With an urbanization rate of 38.9% at the 2002 census, the urban population increased from 1,756,197 inhabitants in 1992 to 2,630,133 inhabitants in 2002 (INSAE, 2003).

Like other cities in Benin, the city of Bohicon is surrounded by several localities including the Avogbanan district, which is considered as one of the Commune's peri-urban areas. This study, entitled "Peri-urban extension of Bohicon and its implications toward the district of Avogbanna", is intended as a contribution. The Municipality of Bohicon lies between 6°55' and 7°08' of north

latitude and between 1°58' and 2°24' of east longitude. Figure 1 shows the geographical and administrative situation of the municipality of Bohicon.

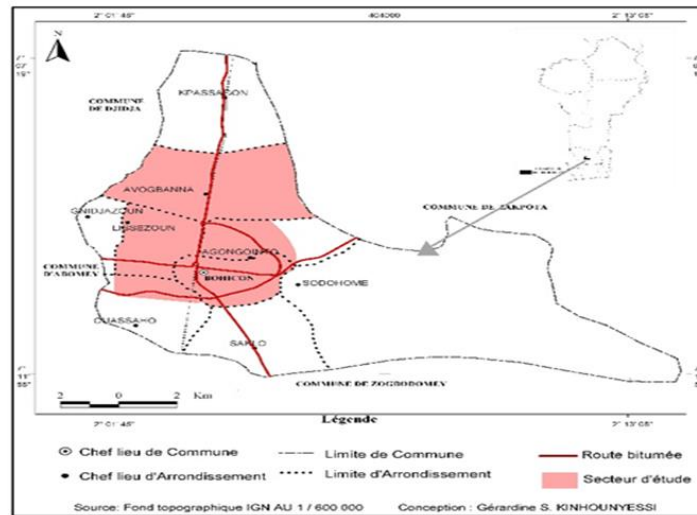


Figure 1: Geographical and administrative situation of the municipality of Bohicon

1. Data and methods

Data are of various kinds and from several sources. The natural data (climatic, morphological and soil). In addition, information related to the demographic statistics of the years 1979, 1992, 2002 and 2013 from INSAE, to the suburbanisation of Bohicon city and its implications toward the district of Avogbanna are collected using questionnaires and observation grids.

Data related to the suburbanisation of Bohicon city and its implications on the district of Avogbanna were collected in two main steps.

The first consisted of group interviews. These groups are made up of farm managers, heads of households and village chiefs. The interview guide included open-ended and semi-open-ended questions, allowing for the collection and prioritization of the groups' perceptions or opinions. This phase enabled the development of the individual questionnaire for the second step.

The second consisted of administering the individual questionnaire to the community intellectual. This questionnaire dealt with peri-urban extension of Bohicon toward the district of Avogbanna, following several items collected during the first step. The questionnaire was administered to 150 farm managers, heads of households, economic stakeholders and heads of farms over 06 districts. The choice of people making up the households surveyed is based on a certain number of criteria: having lived regularly in the survey locality over the last thirty years; being economic stakeholders, a traditional chief, a household chief, a community intellectual, and a farmer.

2. Results

2.1. Socio-economic implications of the extension of the city of Bohicon toward the district of Avogbanna and impact management measures

The social implications are addressed at several levels in the district of Avogbanna such as the development of tertiary and secondary sector activities, environmental implications, impact management measures and suggestions.

2.1.1- Social implications of suburbanisation

The social implications of the suburbanisation of Bohicon on the district can be observed in terms of demographic growth, the social infrastructures construction, culturally, hotel facilities, the development of housing estate and the improvement of the living environment of the populations and the alteration of Avogbanna landscape.

➤ **Population growth**

The population of the district of Avogbanna has been constantly changing since the 1979 census until the last population and housing census of 2013 (Figure 2).

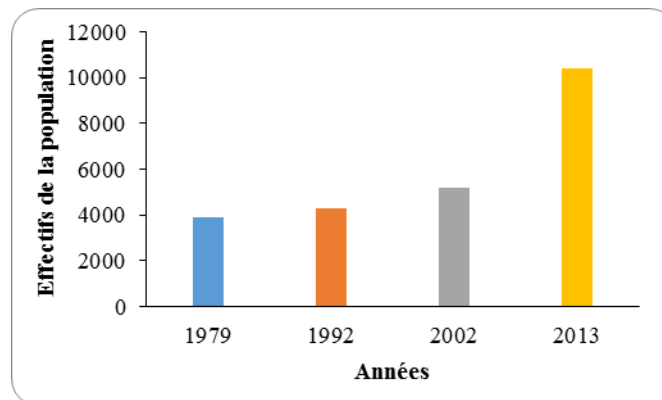


Figure 2: Population dynamics of Avogbanna from 1979 to 2013
Field survey : INSAE, 2013

Figure 2 shows that the population of Avogbanna district has increased from 3888 inhabitants in 1979 to 10387 inhabitants in 2013. In 1992, the population was 4312 and 5172 in 2002. The number of people has doubled from 2002 to 2013, i.e.11 years. It results that the population has been constantly increasing for the last ten years. This growth is favored by the constantly growing development of the city of Bohicon.

Indeed, the development of facilities and tertiary sector activities in the city of Bohicon are factors that attract many people to settle in the latter. However, these people go to the peripheral areas of the city where the living conditions are suitable due to the lack of space. As a result, the vicinity of the Avogbanna district and its location to the inter-State road means that many people now settle in that area.

The district of Avogbanna is increasingly seeing the construction of social facilities. These are of several orders for the population growth.

➤ **Cultural facilities, colleges and schools**

The district of Avogbanna does not have any cultural facilities for the population growth. However, it has a secondary school (CEG Avogbanna) located in Zounzonmè district (Photo 1).



Photo 1: Avogbanna secondary school
Shooting: B. Tchaou, april 2021

Photo 1 shows an incomplete view of Avogbanna General Education College. The latter was created in 2005, has 31 teaching groups and 126 teaching and administrative staff, 76% of whom live in Avogbanna district. There are classes from the 6th to the 12th grade in that college.

It should also be noted that each district has a public primary school (and sometimes even private primary schools). More than 60% of the teachers in these schools are installed in the district to be close to their place of work.

➤ **Hotel and leisure facilities**

There are more than ten hotels and/or hostels in Avogbanna district (planche 1).



Plate1: Hotel Sèna built in Avogbanna and another under construction
Shooting: B. Tchaou., april 2021

Plate 1 shows a hotel built and another under construction in Avogbanna district. In addition to these hotels are also hostels. These infrastructures, which are characteristic of urban environments, are now found in Avogbanna district due to the process of suburbanisation as a result of the extension of the town of Bohicon.

➤ **Water and sanitation infrastructures**

In terms of health, the district of Avogbanna has a public health center already built but not equipped, and has not yet been put into service. But there are several private health centers. This is characteristic of urban areas.

In terms of drinking water supply, Avogbanna has a hydraulic infrastructure (Photo 2).



Photo 2: Hydraulic structure at Zounzonmè (Avogbanna)

Shooting: B. Tchaou, april 2021

Photo 2 shows a hydraulic infrastructure as a result of cooperation between the Municipality of Bohicon and a French association. This, located in the district of Avogbanna, is helping to transform the locality and is a guarantee that drinking water exists for consumption.

➤ **Development of the housing estate**

Local authorities have taken several measures to limit land conflicts as much as possible in the district of Avogbanna its issues are at the root of many difficulties in terms of social cohesion. These measures are taken from central administration of Bohicon town hall to the district of Avogbanna. The process of subdivision has been underway since 2007 in the latter. This process is carried out through five main stages: initiation, inventory of fixtures, study, application and resettlement. Since 2008, resettlement began in the district after the surveyor's work. This provision taken at the level of Bohicon town hall and carried out at the level of the district is a guarantee of land security for the purchasers of plots in that district. But it should be noted that the subdivision operations, apart from Adamè district, have not yet been completed in all the districts of the district of Avogbanna.

➤ **Land tenure, spatial expansion and social transformation in Avogbanna**

The urban space of Bohicon city is increasingly saturated, forcing the populations to move to rural areas in search of a quiet environment. People relocation from the city center to the outlying districts and villages of Avogbanna district has led to a high demand for land (plots) to be built and occupied for other purposes, which increases the price of plots in Avogbanna. The access to land by inheritance has almost disappeared in favor of access by purchase. Land has become a highly coveted commodity for people living in the city center and foreigners. The presumed owners also sell their plots to satisfy their needs. Thus, the land intended for cultivation is sold by peasants giving up agricultural activities. A real speculation on land is then developing, leading to a decrease in agricultural production in the district of Avogbanna.

Table I : Changes of the cost of plots in Adamè district

	Years		
	1991	2016	2020
Non resettled plot	30.000 F	500.000 F - 800.000 F	No more unsettled plots
Resettled plot	No resettled plot	From 1.200.000 F to 1.500.000 F	From 3.000.000 F to 5.000.000 F
Resettled plot in the first position to the tar	-	5.000.000 F	8.000.000 F

Source: Field survey, april 2021

Table II : Change in the cost of plots in Gbetto district

	Years	
	2016	2020
Non resettled plot	300.000 F	500.000 F à 700.000 F
Resettled plot	700.000 F	From 1.200.000F to 2.000.000F

Source: Field survey, april 2021

Table III : Change in the cost of plots in Zounzounmè district

	Years	
	2016	2020
Non resettled plot	From 400.000 F to 500.000 F	From 700.000 F to 800.000 F
Non resettled plot	From 800.000 F to 1.000.000 F	From 1.200.000 F to 1.500.000 F

Source: Field survey, april 2021

Table IV: Change in the cost of plots in Zoungoudo district

	Years	
	2016	2020
Non resettled plot	300.000 F - 400.000 F	600.000 F - 800.000 F
Resettled plot	500.000 F - 600.000 F	900.000 F - 1.000.000 F
Resettled plot in the first position to the tar	5.000.000 F	7.000.000 F

Source: Field survey, april 2016

Table V: Change in the cost of plots in Agbokou and Ahouandanou districts

	Years	
	2016	2020
Non resettled plot	300.000 F- 400.000 F	600.000 F
Resettled plot	600.000 F- 800.000 F	1.000.000 F

Source: Field survey, april 2021

2.1.2- Suburbanisation and social conflicts

The rapid influx of people in Avogbanna district has caused conflicts of cohabitation among inhabitants at social level. Indeed, there are several women selling various objects in front of their houses. There raise conflicts between households when another next door woman does the same business. Likewise, the installation of seamstresses or tailors in the same environment sometimes leads to conflicts between them. The population growth in this district also creates insecurity.

2.1.3- Landscape transformation and housing characteristics

The district of Avogbanna is experiencing an increasing number of modern and traditional dwellings sharing in the same environment with the process of suburbanisation.



Plate 2: Types of housing (modern and traditional) in Adamè and Gbetto

Shooting: B. Tchaou, april 2021

Plate 2 shows two types of coexisting house in the research area. However, it should be noted that not all neighbourhoods are experiencing the same development in Avogbanna district. Thus, there are more modern than traditional dwellings in Adamè and Zounzonmè neighbourhoods. There are modern houses, but not as many as in the previous ones in Gbetto and Zoungodo. Nonetheless, there are hardly any modern dwellings and traditional ones in Agbokou and Ahouadanou.

Modern housing are built in the district either as owner-occupied or rented accommodation. The cost of tenancy also increases according to the type of housing due to the population growth in this district. However, in Avogbanna district, the rent price varies from one district to another due to the position of the district in relation to the interstate road and the city center.

2.1.4- Change of the rental cost in Avogbanna

As the demand for rent increases, its price also surges due to the population growth in Avogbanna district. This rise is not uniform in all districts. Thus, an ordinary dwelling (a bedroom with a living room) costs an average of 9,000 francs, and the one (two bedrooms and a living room), costs an average of 14,000 francs in Adamè and Zounzonmè neighbourhoods because they are close to the interstate. If the building is equipped with sanitary facilities, a dwelling (one bedroom, one living room) costs 13,000 F and a dwelling (two bedrooms, one living room) costs on average 25,000 F.

Further away from the interstate, an ordinary dwelling (one bedroom) is rented for 5,000 F and an ordinary one (one bedroom + living room) is between 9,000 F; and two bedrooms + an ordinary living room is 11,000 F in Gbetto district. Therefore, there is no sanitary housing in the latter.

2.2- *Economic impacts*

The urban expansion of Bohicon city has economic effects on the district of Avogbanna. This district is now witnessing the development of tertiary sector activities as well as secondary sector ones, all of which characterizes urban areas.

2.2.1- Development of tertiary sector activities

Trade, land speculation and tourism are among the tertiary sector activities now developing in Avogbanna district.

Thus, all kinds of commercial activities are evolving more and more in this district. Beyond the local market which specializes in the sale of medicinal plants and other objects used in traditional medicine, the district of Avogbanna is subject of the establishment of maquis and bar-restaurants, etc. (Photo 3).



Photo 3: A restaurant bar in Adamè district (Avogbanna)
Shooting: B. Tchaou, april 2021

Photo 3 shows a restaurant bar in one of the districts (Adamè) of Avogbanna district. It is a place that looks like a restaurant bar in the city center, all of which testifies that the district of Avogbanna is undergoing a metamorphosis due to the expansion of Bohicon city. There are several other centers where commercial activities are being developed like this restaurant bar. We note the development of small businesses in front of concessions to serve the inhabitants of the surrounding area.



Plate 3: Some of commercial activities in front of concessions
Shooting: B. Tchaou, april 2021

Plate 3 shows commercial activities in front of concessions in Zounzonmè and Adamè districts. In the neighbourhoods of Avogbanna district, we notice the development of commercial activities that used to take place in the city center. This shows that the district is undergoing profound transformations. These new shops make it easier for people to buy basic necessities nearby. Alongside these commercial activities, craft activities are also developed (plate 4).

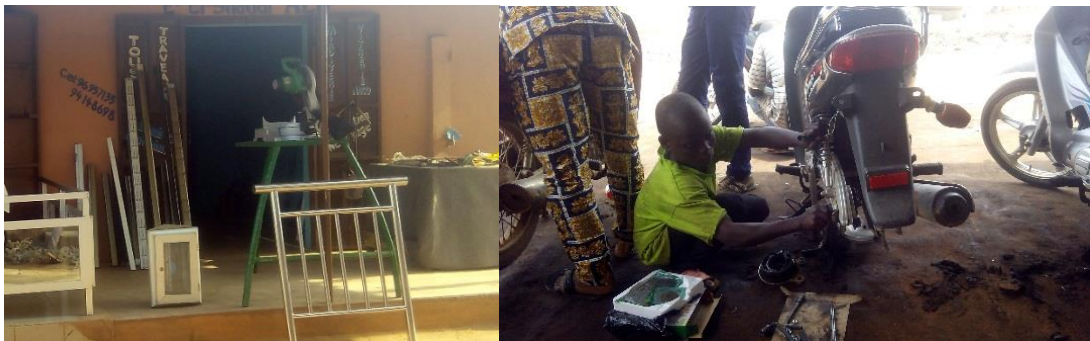


Plate 4: Some commercial activities in Avogbanna district
Shooting: B. Tchaou, april 2021

Plate 4 shows that glazing and mechanical activities are being developed in the district of Avogbanna. The existence of glazery shows that there are more and more houses with beautiful glass, which characterizes urban centers.

2.2.2- Development of secondary sector activities

Secondary sector activities are developing in Avogbanna district. A large company, known as Cotton Development Company (SODECO), employs a large staff in this district (Photo 4).



Photo 4: Partial view of SODECO in Avogbanna
Shooting: B. Tchaou, april 2021

Photo 4 shows a partial view of Cotton Development Company (SODECO) which transforms primary products into secondary ones. Such units are found in Avogbanna district and take part in the process of transformation from rural to urban. More than 80% of the factory's staff live in Avogbanna district to be closer to their place of work.

There is not yet a site in the district that has been developed as a tourist attraction.

2.3- *Environmental implications of population growth*

The population growth in Avogbanna district is supplemented by problems at several levels.

3.3.1- Degradation of vegetation cover

Overall, natural vegetation has disappeared in Avogbanna district. The strong demographic growth leads to strong land pressure on the peripheral areas. As a result, natural resources, mainly vegetation cover, are under strong pressure. We therefore witness the gradual disappearance of the vegetation cover in favour of housing. However, some isolated species are saved or left on undeveloped plots of land, in courtyards or around houses. These species include iroko (*Milicia excelsa*), cailcedrat (*Khaya senegalensis*), neem (*Azadiracta indica*), mango (*Manguifera indica*), etc. The progress of land use over time is shown in Figure 3.

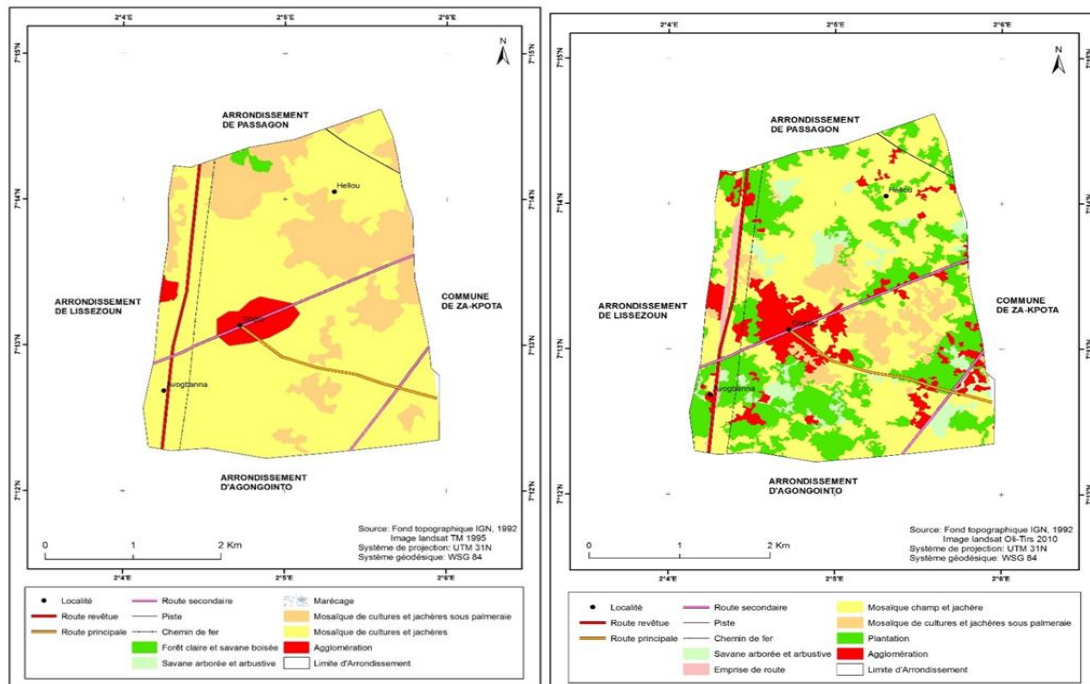


Figure 3: Land use units between 1995 and 2010 in Avogbanna district
 Source: Results of the 1995 and 2010 Landsat satellite image classifications

The evolution of the areas of the different land use units between 1995 and 2010 in Avogbanna district is presented in Table VI.

Table VI: Evolution of surface areas of land occupation units in 1995 and 2010

Units	Area 1995 (ha)	Area 2010 (ha)	Surface Balance 1995-2010	Proportion (%)
Conurbation	43,21	120,74	+77,53	+6,68
Right of way	0	17,78	+17,78	+1,53
Open forest and wooded savannah	6,57	0	-6,57	-0,56
Field and fallow mosaic	849,49	553,77	-295,72	-25,47
Mosaic of crops and fallow land under the palm grove	261,46	87,24	-174,22	-15
Plantation	0	307,09	+307,09	+26,46
Tree and shrub savannah	0	74,12	+74,12	+6,39
Total	1160,73	1160,73		

Source: Results of classifications of Landsat satellite images from 1995 and 2010

It results from Table VI that the units experienced a certain dynamic between 1995 and 2010. Between these years, the open forest and wooded savannah disappeared completely from

Avogbanna district, giving way to the wooded and shrub savannah. The mosaics of crops and fallow land under the palm grove as well as the mosaics of fields and fallows have extensively regressed giving way to plantations. The urban areas have experienced a resurgence of space with a rate of 6.68%, which shows that the district is subject to new human settlements.

In short, it can be concluded that the district of Avogbanna is experiencing a demographic expansion that has disastrous consequences on the environment.

3.3.2- Environmental deterioration

The demographic growth in Avogbanna district is not without consequences on the environment. Overall, there is poor management of household waste and wastewater, the degradation of tracks, noise and air pollution. However, local councilors have developed strategies to make life easier for the inhabitants because of these problems.



Photo 5 : Cotton processing waste dumped in front of SODECO
Shooting: B. Tchaou, april 2021

Furthermore, the population growth in Avogbanna district is followed by a rise in the flow of road traffic. As the district has only one tarmac road, the inter-state road (Bohicon-Dassa-Zoumè section), the remaining of the district's road network is made of red earth, especially the newly opened paths. The traffic rise on these paths quickly leads to their deterioration. Owing to this, the district opens tracks and even to avoid puddles on the roads, gutters are dug and bridges are built in some places.





Plate 5: Opening of gutters in Adamè district
Shooting: B. Tchaou, april 2021

Plate 5 shows that Avogbanna district is making efforts to ease the movement of goods and people in the locality. As in the above-mentioned districts, the construction of gutters and bridges is taking place in several localities in the district of Avogbanna. The completion in a short time will be a great relief for people of this locality. Due to the problems raised by the demographic growth and the strategies underway in the district, it urges to propose additional measures so as to alleviate the problems.

2.4- Proposals for action

The district of Avogbanna is experiencing several difficulties due to the suburbanisation that affects it. The problems raised by this phenomenon are of several kinds and management strategies are underway in that district.

- In terms of land

Les limites notées au niveau de la sécurisation foncière dans l'arrondissement d'Avogbanna concernent notamment la non finalisation des lotissements dans tous les quartiers. Pour garantir la sécurité foncière aux acquéreurs de parcelles dans cet arrondissement, il urge d'achever les travaux de lotissement dans tous les autres quartiers.

- In terms of health

The district of Avogbanna has a public health center that has been built but not yet functional. Only private clinics are operating in the locality. Thus, not all the population has the financial means to afford private health care owing to the cost of health services in these private centers. It is therefore essential to finish equipping and putting into service the public health center so as to relieve the pain of the population.

- Drinking water supply

The district of Avogbanna has only one water tower, but this is not operational enough to supply all households with drinking water. The solution adopted by 35% of respondents is to draw water directly from household wells with a machine used to extract water and store it in a water retention tank for domestic use (Photo 6).



Photo 6: Water tank installed by individuals in their concession for water supply
Shooting: Tchaou, april 2021

Photo 6 shows a water tank installed in a house in Gbetto for the water supply of the inhabitants of this house. This is a strategy that allows people to have water at any times due to the insufficient water supplies in the district. However, not all households have the possibility of setting up this system. This is why the construction of boreholes must continue, mainly in the poorest neighbourhoods to offer them the chance to have access to drinking water at a lower cost.

- Road infrastructures

The local authorities are trying hard to provide roads that meet the needs of the growing population in the borough. But these efforts are still insufficient and will have to be continued to facilitate the movement of people and goods in that borough;

- Market infrastructure

The district of Avogbanna has a single market specializing in the sale of plants and animals used for medicinal purposes. However, in view of the flow of migration to this district, it would be more judicious to build a market in which all the inhabitants of the locality can find their account;

- Waste management

Enjoying a healthy, liveable environment for all depends on waste management. In the rapidly growing of Avogbanna district, each household manages its waste according to its means. To better manage waste, local authorities must encourage the setting up of pre-collection structures for household waste and find a site for its judicious treatment;

- Leisure facilities

Any developing environment needs leisure facilities. For the time being, the district of Avogbanna does not have recreation centers or football fields for the development of the populations and the entertainment of pupils and other people during boredom. A policy for the implementation of these infrastructures would be welcome in the borough.

Conclusion

The rapid urbanisation of Bohicon city with its demographic growth, the rise of the cost of plots, the surge of rental cost, etc., makes it dividing into the surrounding rural areas. The district of Avogbanna is one of the areas that undergo this phenomenon of suburbanisation. This research has made it possible to understand the implications of the extension of Bohicon city on Avogbanna district.

The analysis of the problems raised by this phenomenon and with regard to the measures in progress in the district of Avogbanna, complementary measures were proposed for a good management of the impacts related to the implications of the extension of Bohicon city on Avogbanna district.

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