



ANALYSIS DOCUMENT

Porto-Novo

2011

**A Strategy and urban
design for the city centre**

**The urban regeneration
and historical urban land-
scape of the administra-
tive city centre.**

Preamble

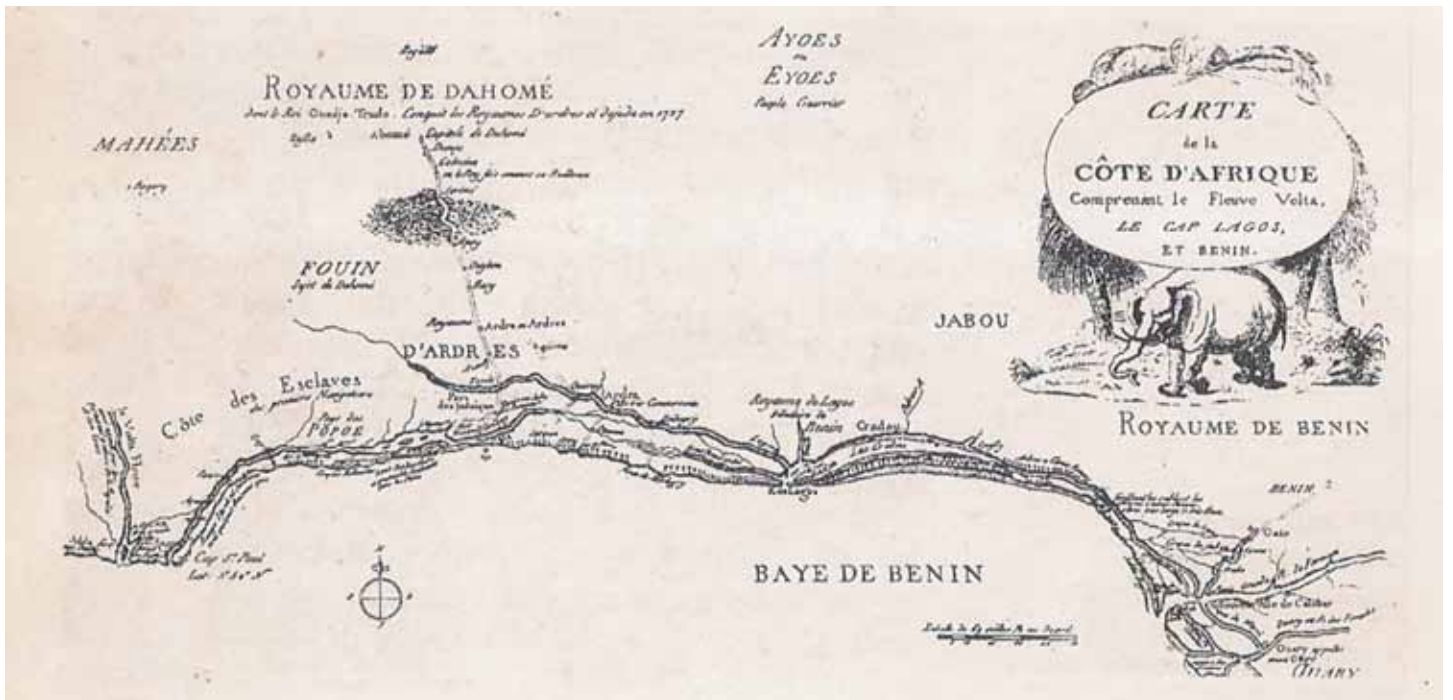
Porto Novo has a rich and colourful history; it is this past which has given the city such a diversity of place, people and culture that can be found today. In recent years it has undergone rapid growth, and this coupled with often severe climatic conditions has resulted in constraints and pressures on its infrastructure, environment and the functioning of the city as a whole.

Now, with Porto Novo becoming more and more established as Benin's capital large steps are being taken to relieve these pressures through a range of improvement projects within the city and its surrounds. These projects are aimed at improving the quality of life within the city while enabling it to function efficiently and safely.

When thinking of maximising the city's potential to support contemporary, sustainable living and growth, the historical urban landscape and intangible narratives should not only be thought of in terms of preservation, but also as a base for modern development based on a system of values linked to this African territory. An urban regeneration plan for the East side of the city centre, which is sensitive to the existing conditions, will bring Porto-Novo a step closer to gaining the status of Modern Sustainable African Capital of the 21st century.

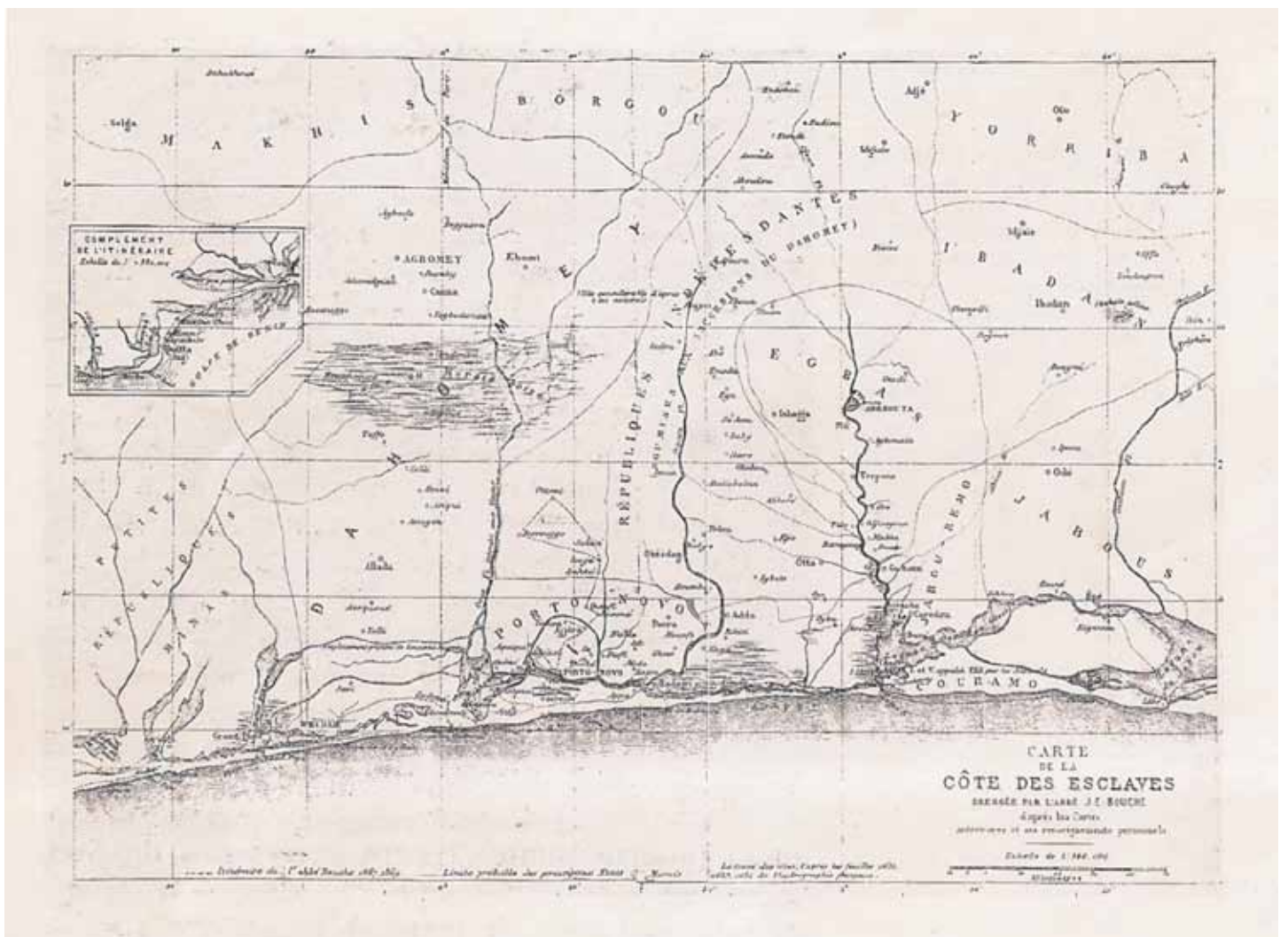
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A map of 'Slave Coast' from 1790 (Sinou, A. & Oludé, B., 1988, Porto-Novo, ville d'Afrique noire, p.22)

PART 1 : BENIN



A map of Slave Coast at the end of the 19th century. (Sinou, A. & Oludé, B., 1988, Porto-Novo, ville d'Afrique noire, p.68)

I / Historical Milestones

Prehistory: Human Presence attested by excavations in the north-east of Benin

1.1 The period of foundation and the kings of Danhomé

1556 : The first Europeans landed in Benin, at Savi (today called Savé), when the capital of the kingdom was Xweda. The Portuguese, French, German and Dutch negotiate with local kings, establishing outlets in Ouidah and Allada.

1575 : The Adja, originating in Togo (Tado) migrate towards the east and founded the Kingdom of Allada. This ethnic group has played a key role in building the history of Benin, and they are the source of the founding of three major kingdoms of Benin (Allada, Abomey and Porto Novo). They gave birth to civilizations based on city-states and helped establish an organized urban functionality.

17th Century : The slave trade grows and takes its full extent. It nevertheless confirms the use of slave labour of African descent from the Pharaonic era and the slave trade is experiencing a boom with the first development of trade with the Arabs.

Local business is taking shape, based on the slave trade organized around a large triangular trade network between ports in Europe (London, Rotterdam, Nantes, Bordeaux, La Rochelle) the African coast (the Slave Coast off what is now Benin, the island of Goree in Senegal and the opposite coast of Angola ...) and the east coast of the Americas (from Louisiana to Brazil). Many commercial trading posts are installed, especially in Ouidah, which was the main port of embarkation of slaves.

1645 : The Adja founded the kingdom of Abomey

1650/1704 : Construction of an English fort and a French fort at Ouidah

1688 : The Adja founded the kingdom of Hogbonou Adjatchè which in the future will be named Adjatchè by the Yoruba (which later became Porto-Novo)

1727 : To ride on the wealth earned from trafficking, particularly from a tax on the deportation of slaves, Agadja King of Abomey (1708-1732), has open access to the coast due to the capture of Allada and Ouidah. The kingdom of Abomey now controlled the slave trade.

1752 : Installation of Portuguese in Hogbonou they renamed Porto Novo in 1782

1807 : Abolition of Slavery

1818-1858 : Reign of King Gezo in Abomey. He develops the production of palm oil and promotes the growing of plants imported from Brazil (cassava, maize, banana, orange, peanut) in his kingdom. Gezo will be one of the greatest kings of Abomey; deploying a strategy of conquest, he transformed the army to have a permanent structure.

1820-1835 : Return of « Afro-Brazilians » freed slaves returning to Africa

1858-1889 : Reign of Glele, son of Ghezo in Abomey. Glélé let the French settle in Cotonou.

1874-1908 : Reign of Toffa Porto-Novo



Ouidah : Slave route which connects to the town of Zounbodgii, where the slaves were enclosed before their embarkation.



Quidah : Gate of no return, erected as a memory of the deported slaves.

1.2 The Colonial Period

1889-1894 : Behanzin, son of Glele becomes king of Abomey (the last king to reign over this kingdom). He promptly enters hostilities against France and seriously calls into question the French presence in Cotonou. In 1892 the battle of Abomey starts, the warriors comprising a corps of Amazons (female warriors) invade the territories under French guard, but the French troops, aided by the Senegalese riflemen emerged victorious and take Abomey. Behanzin surrender to the French, he was then exiled to Martinique, then due to health reasons to Algeria where he later died.

1894 : Creation of «The Colony of Dahomey and Dependencies», which is under the authority of the French Governor Victor Ballot. This colony gathers the ancient kingdoms of Abomey and Porto-Novo which become protectorates, the territories of the South already annexed by the French (Cotonou, Ouidah and Grand Popo) and the North.

1897 : Many troubles arise in the North. The cities of Kouande, Nikki and Kandi take up arms against the French occupation.

1904 : The colony is attached to the AOF (French West Africa) which was the governor general in Dakar, Senegal. In 1956 the FCA has an area of 4,634,000km² which has 18.7 million inhabitants and is divided into eight areas: Ivory Coast, Dahomey, Guinea, Upper Volta (now Burkina Faso), Mauritania, Niger, Senegal and French Sudan (now Mali).

Dahomey was reorganized administratively into 8, then 9 (1938) parts, these themselves cut into townships and villages.

1915 : The revolt is brewing among the population. Many men were conscripted into the armies engaged in Europe. Hostilities resumed in the north.

1.3 Independence and the Marxist-Leninist Regime

4 December 1958 : Creation of the Republic of Dahomey.

1er August 1960 : Independence of the Republic of Dahomey, Porto-Novo is the capital.

1961-1972 : Period of unrest and political instability marked by several power shifts.

1972 : The army took power and dissolved the Presidential Council and the National Assembly. One of the putsch leaders, Mathieu Kerekou, becomes the new head of state. Influenced by the Mai 68 event in France, where he was studied, he's close to the socialists and communists ideologies.

30 November 1975 : Proclamation of the Popular Republic of Benin, which follows the adoption of a Marxist-Leninist regime. A single party is created: the People's Revolutionary Party Benin (PRPB). The political system was inspired by a very distant model ensues, and resulted in the name "laxisme – béninisme". The names of important places of Cotonou (Lenin square, Place de l'Etoile Rouge) testify to this period.

From 1988 onwards : the scheme became more radical, and was subject to pressure from the street, and a general strike was declared.

1990 : In december 1990, a conference of the nation forces (civil society, politician class and military brass) is organized. From this conference, a new constitution is adopted which allowed the multipartism.

1991 : N. Soglo wins the first democratic presidential elections since 1960.

1996 & 2001 : Kerekou wins democratically two elections in a row. He did two mandates. The constitution can't allow him a third one : even if he could changed the mandate limitation because he was still very popular, it was impossible for him to change the age limitation he already reached.

Bénin today : In 2006, Yayi Boni was elected head of state of Benin. In 2011, he was re-elected.



Amazons, female warriors



King Béhanzin

II/ Benin an Overview

1. The Benin - World

Full name: The Republic of Benin

Capital: Porto-Novo

Total area: 112,622 sq km

(land: 110,622 sq km, water: 2,000 sq km)

(world rank: 101)

Total boundaries: 1,989 km,

(Burkina Faso 306km, Niger 266km, Nigeria 773km, Togo 644km)

Coastline: 121 km

Maritime claims - territorial sea: 200 nm

2. Demographics

Population: 9,056,010 (world rank 90)

Urban/Rural Mix: urban population: 41% of total population (2008)

Rate of urbanization: 4% annual rate of change (2005-10)

Age structure:

- 0-14 years: 45%

(male 2,077,591/female 1,995,188)

- 15-64 years: 52.4%

(male 2,358,533/female 2,384,241)

- 65 years and over: 2.7%

(male 98,007/female 142,450) (2010 est.)

Density / Distribution: 59/km²

Porto-Novo : 410/km²

Natural population increase: 2.944% (2010 est.)

Rank in world for growth rate: 14

Birth-rate: 38.67 births/1,000 population (2010 est.) (world rank 17)

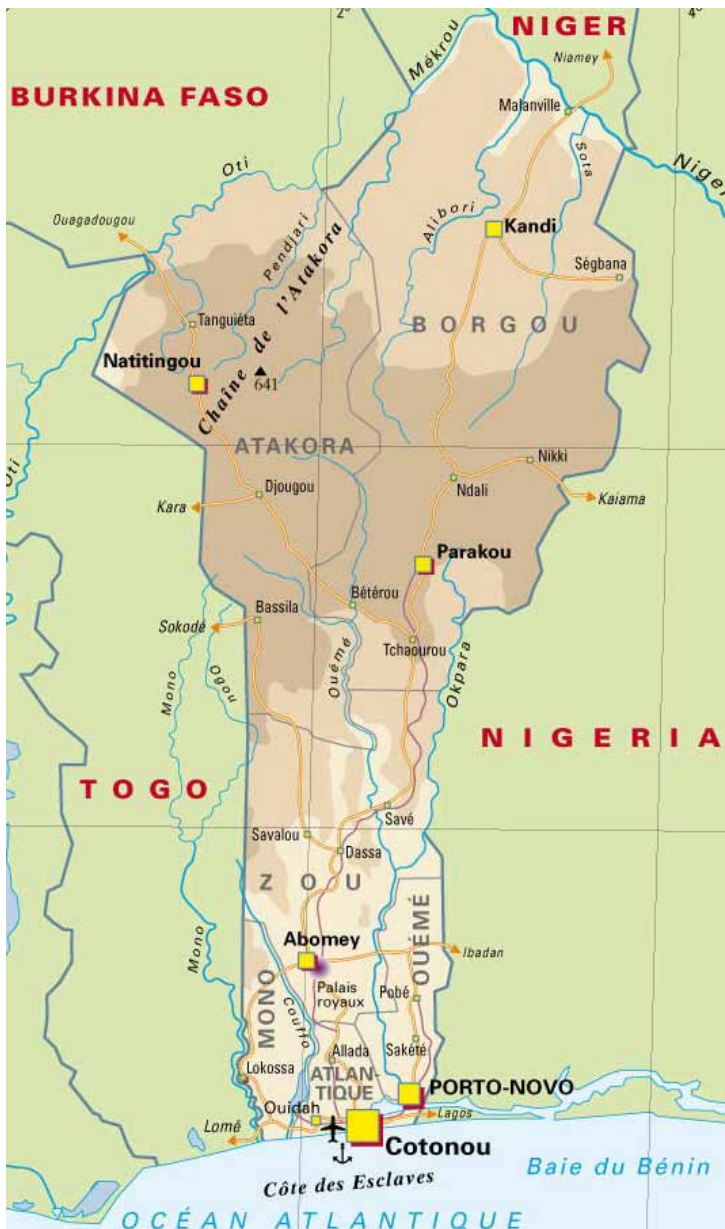
Mortality rate: 9.23 deaths/1,000 population (July 2010 est.) (world rank 74)

Fertility rate: 5.4 children born/woman (2010 est.) (world rank 13)

In 2007: 1.2% of adult population living with AIDS (world rank 50)

Population projection (medium and long term):

According to the UN, the annual population growth rate for 2000–2005 is 2.65%, with the projected population for the year 2015 at 9,093,000. Almost three-fourths of the population are clustered in the southern half of the country.



3. Level of Development

Access to water: 67% of population as an average (12% average household access)

Sanitation: 33% of population (access to sewerage 0%)

Access to electricity: 22% of the population
Production: 124 million kWh (2007 est.)
(world rank 185)
Consumption: 597 million kWh (2007 est.)
(world rank 157)

Electricity - production by source:

fossil fuel: 14.2%
hydro: 85.8%
nuclear: 0%
other: 0% (2001)

Percentage of population below poverty line

37.4% (2007 est.)

HDI (human development index)

0.450 – 0.499

Education/Health

Gross enrollment rate: 96% (2004)

Illiteracy definition: age 15 and over can read & write
total population: 34.7%
male: 47.9%
female: 23.3% (2002 census)

Average period of schooling :

male: 9 years
female: 6 years (2001)

Rates of under nutrition: 19 % of the total population are affected

Rates of malnutrition: 1200-1350 per 100,000 inhabitants



4. Economy

Monetary unit/Rate:

CFA : Communauté Financière Africaine
1 CFA franc = 100 centimes - (655 CFA – 1 euro)

GDP: \$13.25 billion (2009 est.) Rank in world: 139

Economic activity:

agriculture: 33.2%

industry: 14.5%

services: 52.3% (2007 est.)

GDP per capita: \$1,500 (2009 est.) - (world rank 198)

Average wage / salary income: \$1,566 US/1,307 euro

Organization of Economic Activity

Natural resources: small offshore oil deposits, limestone, marble, timber

Agriculture

Irrigated land: 120 sq km (2003)

Land use:

arable land: 23.53%

permanent crops: 2.37%

other: 74.1% (2005)

cotton, corn, cassava (tapioca), yams, beans, palm oil, peanuts, cashews; livestock

Industries

textiles, food processing, construction materials, cement

Tourism: 148,000 people (2009) – (world rank 105)

Services

telecommunication

Major inter country relations

Exports: \$1.024 billion (2009 est.) - (world rank 148)

Exports - commodities: cotton, cashews, shea butter, textiles, palm products, seafood

Exports - partners: China 15.2%, India 13.6%, Japan 8.3%, Niger 4.8%, US 4.5%, Nigeria 4.2% (2008)

Imports: \$1.543 billion (2009 est.) - (world rank 162)

Imports - commodities: foodstuffs, capital goods, petroleum products

Imports - partners: China 36.1%, US 13.3%, Thailand 6.6%, France 6.5%, Malaysia 6.2% (2008)

5. Race and ethnicity

In Benin more than 40 ethnic groups of all sizes exist, giving the country a great cultural diversity. The population is distributed around the three major ethnic groups: the Adja-Fon, Yoruba and Bariba. In Porto Novo, the Yoruba when mixed with Adja give birth to Guns.

Benin's population is divided by denomination between local traditional religions, Catholic & Muslim, and others. The practice of voodoo is not confined to Christianity or Islam and traditional religions strongly influence the social and political life. Islam arrived in Benin from both the North with Dendi, the Fulani and the Hausa and from the sea, with Afro-Brazilians, former slaves deciding to break away from the religion they were taught and further more from the east with the Yoruba.

Voodoo	37%
Catholicism	27%
Islam	22%
Other	14%

Ancestor worship

Ancestor worship is common practice in many countries of Africa and is often at the heart of the main traditional religions. With a family having an ethnic allegiance to a common ancestor they revere. It is often the ancestor who pushed the group's status from hunting to farming that is considered a hero. The Ancestor worship is to ensure life beyond the grave and show that traditions are respected. Ensuring group cohesion is not the only aim of the ancestor, it is also a special intercessor with the gods.

The cult of voodoo

This cult has almost 50 million followers worldwide, and in Benin, it is the traditional religion of the communities Adja-Fon and Yoruba. Born in West Africa, it was subsequently exported by slaves to South and Central America (Caribbean, Brazil, Haiti). Porto-Novo is one of the historical cities of this religion.

The relationship with the gods is established during voodoo ceremonies and rituals accompanied by songs, dances, prayers and offerings made to the fetishes that correspond to abstract representations of voodoo deities. The trance is the most spectacular manifestation of the communion between the individual and the deity. Taking advantage of this communion, the gods or the spirits of ancestors creep into the body of believers and possess them. The man can get in contact with the voodoo with the help of the priest called the « Hounon » and insiders known as the "Voodounsi".

Voodoo is also the symbol of the group or a monarch who reveres and thereby ensures its cosmic identity. Among the voodoo deities, there are deities of primary, secondary, clan, local and accessories. Each family (village), clan, corporation honors its own deities.

Within the voodoo cult there is secret societies whose function is as much social as religious:



Zangbéto

- The eguns, «dead ghosts» : it is through them that the dead appear to their descendants. The eguns society are exclusively male.
- The Zangbeto, «Keepers of the Night» is a kind of police voodoo that occurs when an individual commits an act which goes against the interests of the community.
- Oro-Companies- High number present in Porto-Novo
- Companies Guélédué

1. Physical geography

1.1 Geomorphology and Geology

Typology of Benin 's natural regions

Benin consists of five natural regions. The coastal region is low, flat, and sandy, backed by tidal marshes and lagoons. It is composed of, in effect, a long sandbar on which clumps of coconut palms grow; the lagoons are narrower in the western part of the country, where many have become marshes because of silting, and wider in the east. Some are interconnected. In the west the Grand-Popo Lagoon extends into neighbouring Togo, while in the east the Porto-Novo Lagoon provides a natural waterway to the port of Lagos, Nigeria, although its use is discouraged by the political boundary. Only at Grand-Popo and at Cotonou do the lagoons have outlets to the sea.

Behind the coastal region extends the barre country — the word being a French adaptation of the Portuguese word barro (“clay”). A fertile plateau, the barre region contains the Lama Marsh, a vast swampy area

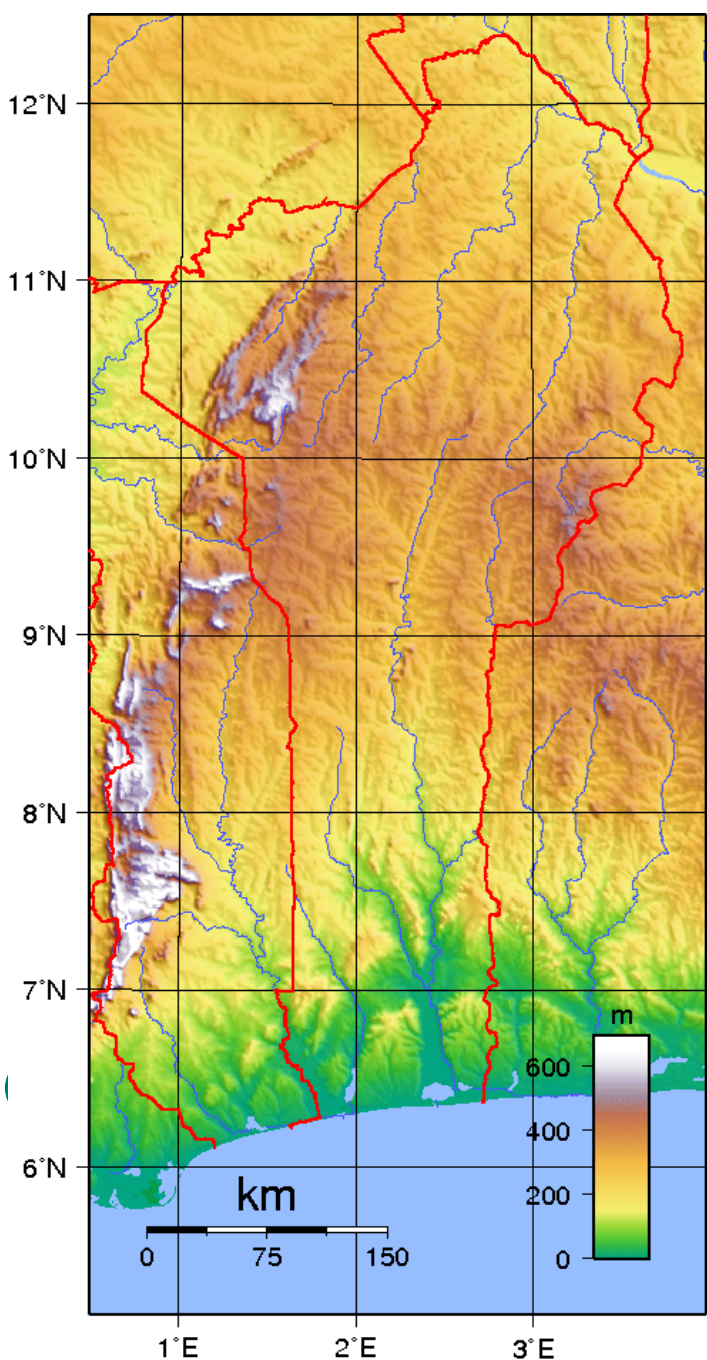
stretching from Abomey to Allada. The landscape is generally flat, although occasional hills occur, rising to about 1,300 feet (400 metres).

The Benin plateaus, four in number, are to be found in the environs of Abomey, Kétou, Aplahoué (or Parahoué), and Zagnanado. The plateaus consist of clays on a crystalline base. The Abomey, Aplahoué, and Zagnanado plateaus are from 300 to 750 feet high, and the Kétou plateau is up to 500 feet in height.

The Atakora Mountains, in the northwest of the country, form a continuation of the Togo Mountains to the south. Running southwest to northeast and reaching an altitude of 2,103 feet (641 metres) at their highest point, they consist of a highly metamorphosed quartzite interior.

The Coastal Plain

The coastal plain consists of a number of geomorphic units, divided into three sectors by the channel Aho which connects lakes Aheme and Nokoué to the sea. In the lower Ouémé valley a vast delta completes the plain. Within the coastal plain there



Topographical map of Benin



Typical plateau landscape

are lowlands which correspond to depressions forming lagoons or marshes. These low lying areas of the lower Kouffo river, Lake Ahémé, into which the river drains, and the 'Aho complex' consisting of marshes beside the Aho river and the coastal strip between the towns of Grand-Popo to the west and Ouidah to the east. The south of Lake Ahémé is fringed with *Typha australis* and the Aho supports mangroves (*Rhizophora* sp. and *Avicennia* sp.), maintained by seasonal influxes of brackish water.

The delta plain common to the Ouémé and Sô is 24 km north of Lake Nokoué. It has an extremely flat topography, only cut by distributary channels of the two rivers, with locally, surveys of shoreline.

Key lagoons within the coastal plain

- **The lake Aheme** guidance meridional-long 24Km with an area of 70-100 sq. km and a depth of about 2 to 2.50 m.
- **The coastal lagoon** runs parallel to the coast of Grand-Popo to Togbin, with a relatively deep to the west of its mouth on the Sea (4-5 m during the rainy season).
- **Lake Nokoué's** area varies according to the season (200-300 sq km), the depth is generally less than 3 m.
- **The lagoon of Porto-Novo**, a basin of up to 6 meters in places. This series of lagoons and wetlands to some extent cut off Porto Novo from the coast.

Coastal Ponds

Benin's coastal ponds occur horizontally across the country, slightly inland near to large settlements such as Cotonou and Porto Novo and exist at sea level changing greatly throughout the seasons, in direct relation to water flows and volumes discharged into them, highlighting the fragility of these areas and the delicate balance between them and the urban areas bordering them. Many towns are relatively cut off physically from the coast by these lagoons regularly causing connectivity problems. Porto Novo is the largest settlement which suffers from this disrupted connectivity.

Generally the lagoons are swampy land subject to seasonal inundation occupies a strip 96 km long and upto 7 km wide (mean width 3.6 km) behind the barrier dunes along the entire coastal strip, with a total area of some 29 000 ha. These swamps are developed along a semi-continuous line of narrow lagoons, which are weakly tidal. The swamps, although not the lagoons, provide a continuous wetland, connecting the swamps at the mouth of the Mono River on the Togo border with those that surround Lake Nokoué and Lake Porto Novo on the Nigerian border. The floodplain swamps of several minor coastal streams, e.g. the Toha, Todouba and Dati, which discharge into the lagoons, extend these coastal swamps up to 20 km into the coastal plain.

The lagoons are best developed in the west, where they are in contact with the sea through the Boca del Rio, but they peter out in a series of small lakes just before Cotonou is reached. Some of these little lakes may become continuous in June-July, at the height of the rainy season, and the large central lagoon may gain contact with the open western lagoon near the village of Djêgbadji (6°19'N/2°05'E), carrying the discharge of the minor coastal streams to the sea.



Typical plaine landscape



Ouidah's lagoon

Flora & Fauna

The lower swamps are tidal, and especially towards the Boca del Rio, they support scattered mangroves and extensive swards of *Paspalum distichum* with various sedges on their fringes. Groves of *Hibiscus tiliaceus* and *Pandanus candelabrum* occur on some shores. *Sporobolus virginicus* is common in the fringes on the seaward side. *Avicennia* and *Conocarpus* occur around some of the isolated lagoons. Reeds and bulrushes occur on affluent streams, and fringe some of the upper lagoons. The fish fauna is characteristically estuarine in the western areas, but both marine and freshwater species occur in the eastern lagoons and in the affluent streams. Several marine fishes and prawns enter the lagoons to breed, after which their juveniles utilise the lagoons as nurseries. There is a rich coastal fauna.

Human Impact & Utilisation

The southern third of the country is far more densely populated than the north, and the three major cities of Grand Popo, Cotonou and Porto-Novo have been constructed in the coastal strip. A main international road and railway run along the landward side of the swamps, the ramparts built for these structures in places effectively limiting the landward extension of the inundated lands. Both the road and railway cross the swamp belt west of Cotonou, and the city interrupts the swamp lands on the southern shore of Lake Nokoué.

Locally the lakes, lagoons and swamps are fished, and the adjoining lands which are free from inundation, are intensively cultivated, but apart from drainage and clearances for buildings around villages, the swamps of the coastal strip have not been extensively altered since traditionally the wetlands are considered unsuitable for agriculture. Hunting takes place in the swamps and many water fowl are killed each year.

Conservation Status

It was proposed in 1985 that a reserve be set up to protect some mangrove areas, but the wetlands of the coastal strip are presently unprotected.

Hydrographic Network

Benin has a vast and relatively complex hydrological network which displays a range of typologies both geographically (from the drier north to the lower lying wetter south) and seasonally displaying large shifts in flows and water quantities. The country has over 330 km² of lakes and lagoons.

There are several groups of lakes associated with the floodplains of the south-flowing rivers. On the Ouémè there are Lakes Azilli and Cele and on the Mono there are about six lakes, but siltation and other changes due to management of this basin are altering their characteristics very rapidly.

Hydrologically the country can be divided into five main drainage areas:

- to the north Benin borders on **the Niger River** for about 120 km and the three main mid-course tributaries of that river (the Alibori, Sota and Mekrou Rivers) arise on the central plateau of Benin to flow torrentially northward into the Niger. The Benin bank of the Niger has a broad floodplain covering about 275 km² at peak floods;
- **the Pendjari River**, a tributary of the Volta, drains the western slopes of the Atakora mountains and runs for some 400 km through Benin before entering Togo.

The south-flowing rivers:

- **the Mono** (400 km),
- **the Couffo** (240 km), and
- **the Ouémè** (500 km), arises on the central plateau and, below torrential upper courses, form broad fertile floodplains in the coastal zone. The floodplains terminate in a series of extensive lagoons. The greatest of the floodplains, that of the Ouémè, extends over 2 000 km² at peak floods.

Ouémé and the lake Nokoué

The major river in southern Benin is the Ouémé also spelt WEME, river rising in the Atacora massif in northwestern Benin. It is approximately 310 miles (500 km) in length and flows southward centrally through the country through areas of flat lands interspersed with rocky. The altitude of the rocky hills does not extend beyond 400 meters. Further south it is joined by its main affluent, the Okpara, on the left bank and by the Zou on the right. It then divides into two branches, one discharging into Lake Nokoué near Cotonou and the other into Porto-Novo's lagoon.

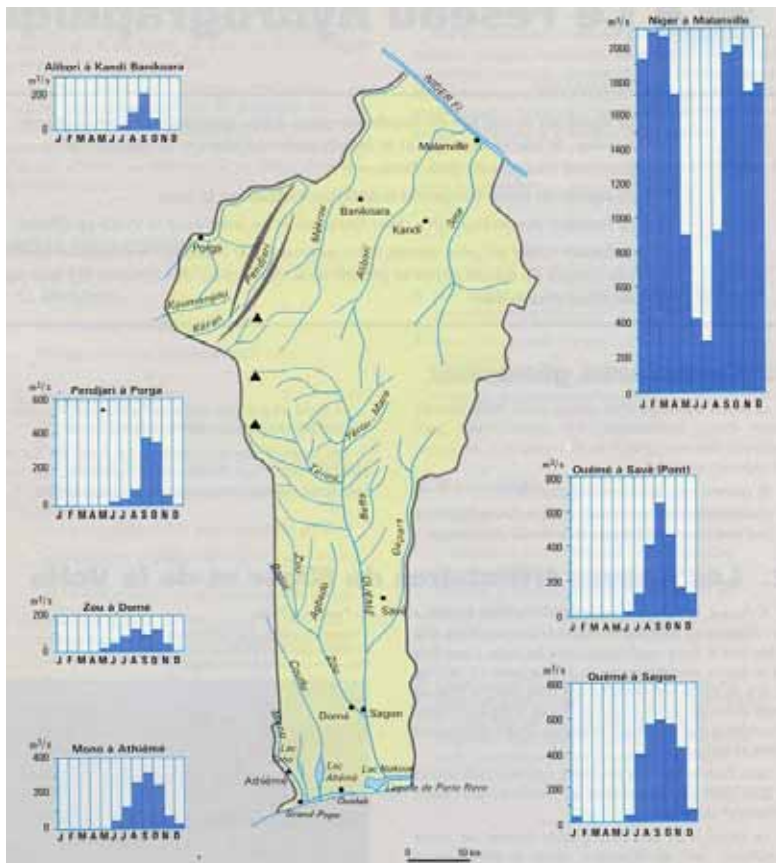
Rain forests grow along the shores; navigation, although impeded by rapids, is possible during the rainy season. The river's fish, including freshwater and processed, are exported to Nigeria and Togo. Millet, sweet potatoes, and yams are cultivated, and the Ouémé Valley development scheme has been undertaken to improve agriculture.

Lake Nokoué is an extensive lagoon of c.16,000 ha, 20 km wide by 11 km long (north to south), immediately north of Cotonou. Its northern shore is formed by the deltas of the So and Ouémé rivers. It is connected to the sea not only via a channel through Cotonou, but also by another to the Lagune de Porto-Novo to the east and thence to the coast in Nigeria. On the western edge is the remarkable aquatic town of Ganvié, built on stilts made of bamboo or tree-trunks sunk into the water. The southern edge of the lake has the highest salinity, and is fringed with *Typha australis* as well as the ubiquitous grass *Paspalum vaginatum*. Seasonally the lake inundates areas of forest containing (*Berlinia grandiflora* and *Dalium guineense*), swamp-forest (*Mitragyna inermis* and *Raphia hookeri*), marshes and flood-plains of rivers north of it, up the Ouémé river as far as the village of Sagon, 10 km south-east of Zangnanado.

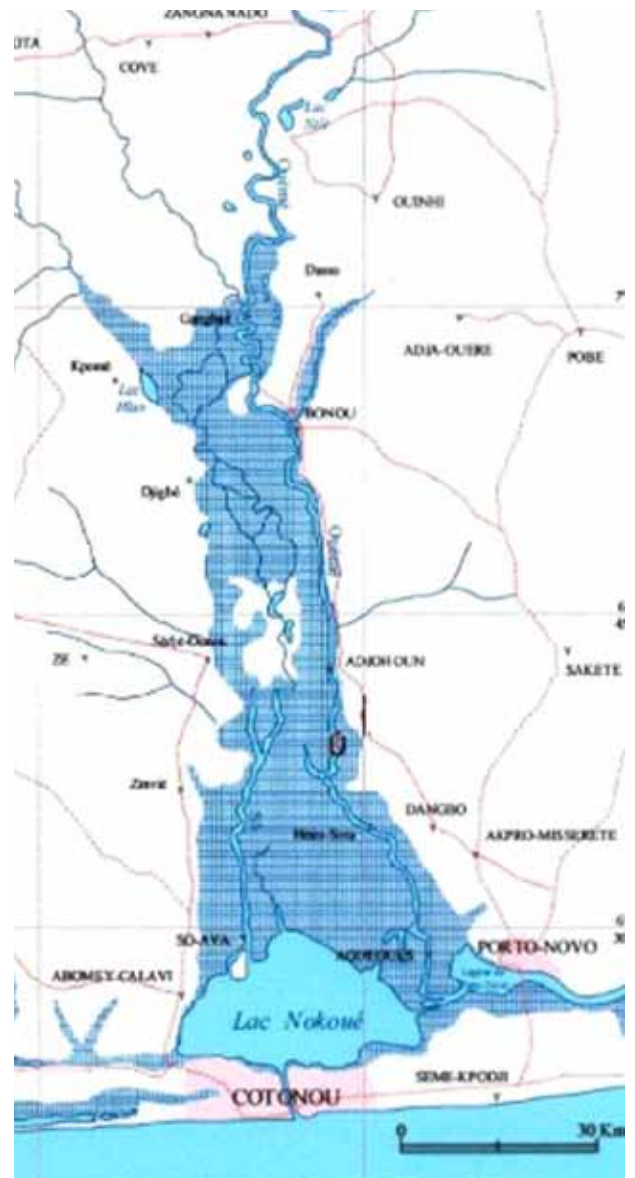
The lake Nokoué's acreage is very variable according to the seasons (200 to 300 km².) the profundity is generally inferior to 3 m. The lagoon of Porto-Novo, has a large basin that can reach a depth of 6m in places.

Habitats and percentage cover of Lake Nokoué

Artificial landscapes (terrestrial)	5%
Forest	47%
Scrubland	21%
Wetlands	14%
Unknown	13%



Benin's hydrological network and annual water quantities



The hydrological network and flood areas of the Oueme and Lake Nokoué

The Couffo

The Couffo rises in eastern Togo and crosses the western border of Benin flowing through plateaus and near to the important town of Abomey, southward through the country until it drains into the coastal lagoons at Aheme. It is 240km in length and has a comparatively straighter course to the River Mono, making it faster flowing in places thus further limiting accessibility. The only part of the river which is navigable is near its mouth. The natural vegetation of the undulating clay tableland within the drainage basin of the Couffo has been replaced largely by cultivated areas for maize, yams and cassava.

The Mono

The Mono River rises in eastern Togo near the Benin border and flows south. It is approximately 400 km (250 miles) long taking a meandering course, and draining a basin of about 20,000 km² (7700 sq mi). Along the southern portion of the river towards its mouth, it forms the international boundary between Togo and Benin. The river drains into the Bight of Benin through an extensive system of brackish (water with less salinity than sea water but more than fresh water) lagoons and lakes, including lake Togo. Similarly to the Couffo the part of the river nearest its mouth is navigable. The natural vegetation of the undulating clay tableland within the drainage basin of the Mono has been replaced largely by cultivated areas for maize, yams and cassava.

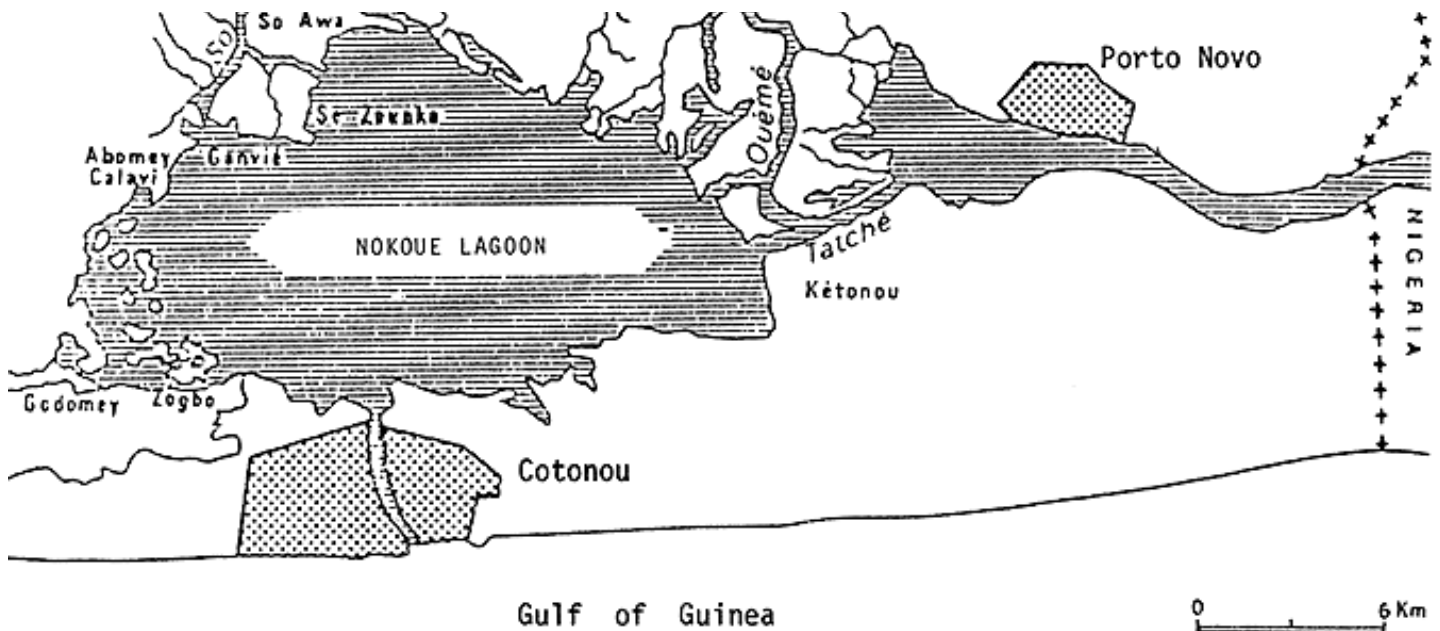
The river is dammed 160 km (100 miles) from its mouth by the Nangbeto hydroelectric dam, a partnership between Benin and Togo completed in 1987. Studies have reported economic benefits from the dam, including tourism and fishing in the lake behind it. The dam's construction displaced between 7,600 and 10,000 people, however, and studies indicate that it has substantially modified the ecology of the lagoon system at the river's mouth by reducing the natural seasonal fluctuations in river flow. A second dam project, Adjarala, was proposed to be built on the river between Nangbeto and the river's mouth during the 1990s, but has not been constructed.

Conservation issues

In January 2000 much of the area was declared a Ramsar Site, known as Basse Vallée de l'Ouémé, Lagune de Porto-Novo, Lac Nokoué and covering 91,600 ha. Threats include hunting, poaching, pollution, mangrove destruction and deforestation. Traditional fishing methods may, however, benefit birds. Fishermen plant branches in the muddy lagoon bottom, surrounded by platforms of bamboo sticks and palm-leaves. When the leaves on the branches start to decompose, fish congregate to feed at these sites, known as acadja, before boatmen (and birds) return to catch them.



Wetland of Lake Nokoué



The Nokoué framework

2. Climatic factors and variations

Two climatic zones may be distinguished—a southern and a northern. The southern zone has an equatorial type of climate with four seasons—two wet and two dry:

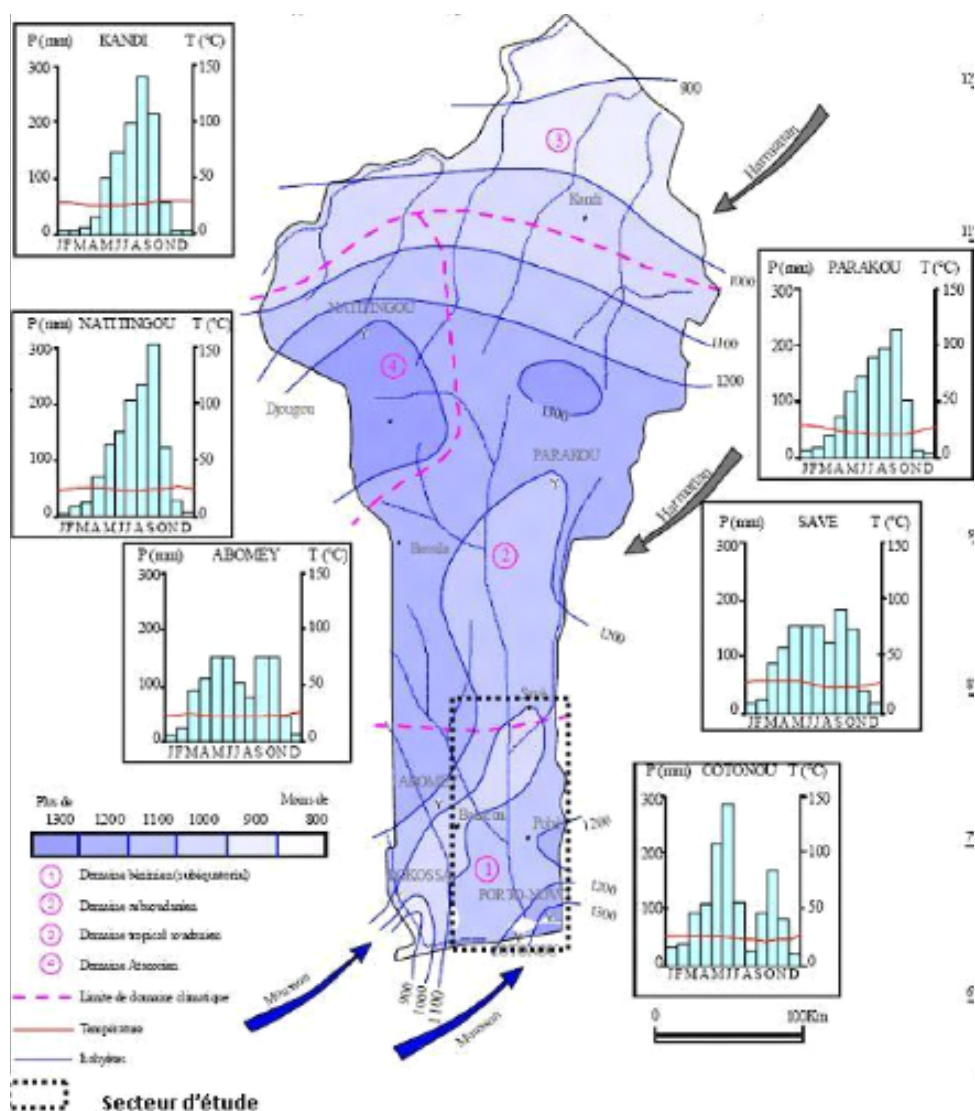
- The principal rainy season occurs between mid-March and mid-July
- The shorter dry season lasts to mid-September
- The shorter rainy season lasts to mid-November
- The principal dry season lasts until the rains begin again in March.

The amount of rain increases toward the east. Grand-Popo receives only about 32 inches (800 millimetres) a year, whereas Cotonou and Porto-Novo both receive approximately 50 inches. Temperatures are fairly constant, varying between about 72° and 93° F (22° and 34° C), and the relative humidity is often uncomfortably high.

In the northern climatic zone, there are only two seasons, one dry and one rainy. The rainy season lasts from May to September, with most of the rainfall occurring in August. Rainfall amounts to about 53 inches a year in the Atakora Mountains and in central Benin; farther north it diminishes to about 38 inches. In the dry season the harmattan, a hot, dry wind, blows from the northeast from December to March. Temperatures average about 80° F (27° C), but the temperature range varies considerably from day to night. In March, the hottest month, diurnal temperatures may rise to 110° F (43° C).

Micro-climate of the Coastal Zone

The coastal zone of Benin is characterized by a climatic anomaly that results in a decrease in rainfall from east to west along the coast, with the temperature changes more pronounced than they usually are in equatorial climates characteristics: it displays more a sub-equatorial climate.



Typical annual rainfall and climatic patterns

Winds

Within the coastal zone, exist several types of winds: The regional fluxes bound to the fields of pressure (with the global scale) and the local winds. The current statistics cover quite long period (from 1952), but they stay restricted to Cotonou's only station and therefore are not conclusive. The wind direction and frequencies which prevail on Cotonou 's coastline are:

- **SW** (64 %): The monthly division points out very strong frequencies in February; March; April; May, June, October and November. The wind speed average is 4,4m/s with the maximum value in July August (5,6 and 5,4m/s.)
- **WSW** (16,07 %): The most elevated frequencies are centered around July, August and September with a wind speed average of 6m/s. High speeds are noted between July, March, November and December, an average of 3,6 m/ s.

The winds over the coastal region control the lagoons and waves causing a certain amount of dissymetry in the banks. It is observed that the mudflats are always located on the South and South- West of the lakes Ahémé and Nokoué as well as in Porto-Novo's lagoon while on the north banks, beaten by the waves, where in general it is more common for sand banks to form.

Air Temperature

The average temperature varies very little in the coastal zone of Benin (27° surrounding Cotonou and Ouidah.) Within the seasonal scale, the region stays elevated in dry season (27,7°C On average) and relatively weak in rainy season (26,5°C.) The warmest months are February, March and April, know relatively strong amplitudes: Fresh nights (23 - 24) followed sunny days and hot (°C) (31 - 33 °C.) Some July and August, the sensitive fall east (25°C.)

The variations heat on the coast are bound at the duration in the insolation and to the maritime influence. The freshest period (July August) corresponds in sea, in the rise of cold waters (upwellings) coming of the South and freshen the coastal region up.

Rainfall

At low latitudes, precipitation is the most variable of climatic factors across the monthly timescale; it is this scale which allows us to identify the season. It differs in the coastal zone of Benin, two dry seasons (December to March and August), with no or insufficient rainfall (rainfall less than 40 mm, near zero in December, January and February) and two rainy seasons (April to July and September to November) when it rains more frequently and abundantly (the monthly average exceeds 170 mm). It is therefore a bimodal regime, with two unequal peaks of; 40-65% in the first rainy season and 18-30% in the second (Boko 1998).

3. Nature reserves, national parks, regional parks

National Parks

Benin has two national parks both situated in the north of the country:

The Pendjari National Park borders Burkina Faso, while the W National Park extends into that country as well as into Niger. These two parks are part of the largest group of protected areas in West Africa, the complex of Park W-Arli-Pendjari, which straddles the borders of Niger, Benin and Burkina Faso. This complex covers a total area of 19,305 square miles (50,000 sq km), of which 4,633 sq mi (12,000 sq km) is in Benin. This is the second largest protected ecosystem in West Africa; only the Comoe National Park in Ivory Coast is comparable in size.

The area these parks lie in is considered one of the most important humid ecosystems, with extensive biodiversity, in the sub-sahelian area of West Africa. The area is characterized by forests, savannah and swampy meadows, alluvial plains, ponds, rivers, and dense dry forests within floodplains. Animal life, including big game-animals, is abundant. Pendjari is especially known for its birdlife.

Nature Reserves & Regional Parks

Benin posses a large number of large nature reserves which attract a growing number of tourists each year. Some of these reserves are used for legal hunting while they are also recognised for there diverse range of wildlife most notably birdlife. These areas tend to be fragmented across the country and are split into groups including: classified forests, reforestation areas and hunting zones sometimes with some crossover. The classification of regional parks is a bit unclear across the country and a lot of the time these areas tend to be informal and locally determined often with some protected areas also serving as regional parks.

1. Environmental pressures and natural hazards: a fragile coastal zone

4.1 Coastal erosion and flooding

The coastal sedimentary basin consists of a low plain, sandy, swampy and dotted with lakes and lagoons. The coastal zone covers 30 administrative districts and covers 8692 km² approximately 7.7% of national territory.

It is characterised by three Agro-Ecological zones :

- Wetland zone = 3461 km²
- depression zone = 1852 km²
- 'Barre' land zone = 3,379 km²

The coast of Benin is generally quite fragile and sand extraction on the coastline is the main cause of local erosion known in some places, particularly in Cotonou. The advancing sea is a direct result of sea erosion; neighborhoods are threatened by floods in Cotonou and many houses have already been submerged.

The city of Cotonou suffers from cyclical flooding, three main reasons can be identified:

- The abundance of rainfall in rainy season
- The overflowing of rivers
- Stagnant water

This third factor of flooding is mainly due to poor water infiltration into the soil (the water table is deep in Cotonou such as 2 to 6 meters). The stagnant water remains sometimes for two to three weeks, causing damage and completely blocking some lanes and roads forcing people to leave their homes, displacing large sections of the population.



A street in the Koutongbé neighbourhood, before and during the rain (June 2010)

In Porto Novo, floods are becoming less and less, but in recent years the city recorded floods in some parts of the city where the phenomenon had never been recorded before, especially in Tokpota. These floods are caused by sinkholes which are unsuited to the high urbanization rate and the influx of populations to an area.

4.2 Wetlands: Ecosystems under pressure

The lower valley of Ouémé, the lagoon of Porto-Novo (35 km²) and Lake Nokoué (150km²) form a vast wetland, the largest of Benin with an area of 91,600 hectares. The recognition of the specificity of this zone in regional planning is very recent.

The wetlands of southern Benin are among the most productive systems, these areas contain vital natural resources for economic activities for many people. In ecological terms, the wetlands have several vital functions such as replenishing groundwater, water purification or flood control. But these areas are vulnerable, and some practices cause deforestation of the protective vegetative cover which increases soil erosion and damage to their banks and slopes, which in turn accelerates the draining of water, posing a major threat to the delicate Ecosystems which exist there.

Fauna and Flora of wetlands

In wetlands, the amount of vegetation and ecological niches is large. Among the most common species include *Paspalum vaginatum*, a species that grows only in brackish wetland along with *Phragmites australis*, also known as the common reed.

Fish fauna is extremely rich and varied in areas such as Lake Nokoué. Results of surveys conducted at the lake between 2000 and 2001 reveal the presence of 51 species of fish divided into three major groups: marine, freshwater and lagoon species. Three groups of fish dominate the entire fish fauna throughout the year:

- Tilapia: *Sarotheron melanotheron* *Tilapia guineensis*
- Clupeidae: *Chrysichthys nigrodigitatus*, *C. auratus*
- Clupeidae: *Ethmalosa fimbriata* and *Pellonula leonensis*

In lake areas domestic wildlife, which is used for breeding is mainly composed of cattle, pigs, sheep and poultry.

According INSAE-The National Institute of Statistics and Economic Analysis, Benin ; the population of the villages along the lake Nokoué continue to grow and is estimated at 76,315 inhabitants according to a study that dates back to 2003. The development of cities on the lake Nokoué and commercial fisheries and tourism that take place there, are potential sources of pressure on the lakes fragile ecosystem. The increase in the lake population and urbanization of towns bordering the lake, including Cotonou, have consequences for the area such as the increasing amount of waste that is produced in these areas then discharged into water.

The anarchic processes within these wetlands by human settlements is justified by the absence of land policy. Such pursuits, if continued over time, will lead to the long-term loss of these areas, the filling of these sites and accelerating of the frequency of flooding.

4.3 The site of Porto-Novo: a wetland issue

A study by CIPCRE-Benin-International Circle for the Promotion of Creation- most wetland sites listed common problems in the department of Ouémé: In Porto-Novo, part of the lagoon (including the site of Lokpodji), the Zounvi Donoukin depression and the East bank of the Boué depression are subject to strong environmental pressures and it was found the site of the town of Porto-Novo is considered the most vulnerable.



Vegetation in the wetlands : Example of Porto-Novo's swamps



Garbage and backfilling

Problème n°1	Problème n°2	Problème n°3	Problème n°4	Problème n°5	Problème n°6
Insalubrity and filling	Technical review of operating	Pressure on natural resources	Water Pollution Problem	Soil Erosion	Anarchic occupation
Deposit of garbage and filling	Agricultural and exploitation	Extraction of sand from the lagoon	Transit and trade in petroleum products	Damage of rain erosion (removal of works, loosening and breaking, bank erosion)	Anarchic occupancy by human settlements (houses, sheds, etc. .)

Source: «Wetland Sites problematic Department of Ouémé» was initiated in the framework of the implementation of the project «Promotion of Local Environmental Governance (Progel) »

Fly tipping and dumping in the landscape

There are informal rubbish dumps in large areas of Porto-Novo's wetland and lagoon, this due to the lack of servicing of urban land, poor organization of waste collection and the degree of impoverishment of the population. All this has caused and enhanced pollution and the infilling of wetland sites, thus there is a progressive loss of biodiversity and the ecological role of wetlands with (extinction of wildlife, soil erosion...). frequent flooding in Porto Novo and its potential to spread diseases (water and faeces risk).

The extraction of sand from the lagoon

Beyond the economic boost it creates, the extraction of lagoon sand, is primarily linked to the high demand for sand for the needs of local the population (construction). This practice is problematic for many environmental reasons notably fish biodiversity of wetland sites.

The flow of petroleum products

The transit and trade in petroleum products (gasoline, motor oil, diesel) are real sources of pollution to the wetland ecosystems. Often these pollutants are discharged into the lake intentionally or accidentally during transport, selling or during the refueling of vehicles. These actions are amongst the main reasons for the declining productivity of fish and shellfish from Lake Nokoué and the current high amounts of petroleum products is driven by the economic attractiveness of trade of oil products from neighboring Nigeria.

Number of oil related product tankers, related to the owners of motorized boats by cities near Lake Nokoué

Location	Number of carriers in %
Cotonou	33,00%
Sèmè-Podji	33,00%
Ganvié	38,00%

Source: The pollution of water bodies in Benin, Edia Dovonou Flavian, University of Abomey-Calavi, Benin

Among the drivers of motorized boats are many carrying petroleum products. For transportation, spill volunteers were to balance the overcrowded boats to avoid accidents, or decrease the load in order to evade customs proceedings. As for accidental spills, they typically are due to bursts of drums and users to the capsizing of boats especially during storms or during strong currents beyond the control of drivers.



The extraction of sand from the Lagoon of Porto-Novo

Water hyacinth

The flooding of rivers is most worrying for many reasons, but now because of an influx of water hyacinth (*Eichornia crassipes*) in the area there is growing concern when a river floods because of its rapid growth and its rapid invasion characteristics. Under favorable conditions, 10 plants can grow up to 600 000 plants in eight months and cover 4,000 sq.m.

Erosion damage due to rainfall

Erosion damage due to rainfall (ie removal, loosening, demolition of structures and bank erosion) is widespread because of the site of the city and its topography, the city is built on the contact between a plate and sedimentary floodplain of lake Nokoué. This topography has created steep slopes leading to the depressional wetland areas. During a storm the force of the resulting stormwater often has sufficient strength to undermine and demolish the structures built to drain the water (drainage, drains, culverts etc..) These elements are often not made to the standards of resistance required and therefore fail.

The techniques of the acadjas

The acadjas are traditional techniques for breeding and catching fish that increase fish productivity. The acadja involves implanting artificial substrates, piles of branches planted in shallow waters where the fish hides, feeds and reproduces. Its realization requires the use of a large amount of branches and organic matter. In Lake Nokoué and the lagoon of Porto-Novo this process is a key source of organic pollution which affects the depletion of fish from Lake Nokoué and the related streams. But this practice, by the amount of biomass it produces, tend to involve more bridging courses.

2. Political Environment

The Ten Commandments of the Environment (Act of 12 February 1999)

In Benin, the environment is a constitutional right (Article 27 of the Constitution of December 11, 1990).

- The environment of Benin is your heritage you have to protect against any attack
- You must not emit, throw or permit the emission of a contaminant in excess of the amount provided by the laws and regulations
- You have the duty to contribute to the sustainable management of our resources such as water, air, soil, sub-soil, plants and animals
- You will not build when you do not do or will put to use a suitable building
- sanitary conditions, hygiene and safety are contrary to the standards set by law
- You shall not lay waste in unauthorized places and you will not emit noise beyond the standard set by law
- You have the duty to develop your plan, your program or the implementation
- of your projects to the environmental assessment process as provided by law
- You have the obligation to prepare, as a promoter of classified installation, an emergency plan in case of a disaster
- You will notify the authorities in the case of the presence of contaminants in your environment
- You will be held responsible if you pollute your environment and you must amend the consequences of your pollution or face sanctions
- You must not import, sell or circulate harmful chemicals, which are dangerous and prohibited.

Charter International Environmental Governance



Water hyacinth



An aerial satellite photograph of a city and its surrounding landscape. A wide river flows through the center of the image, with several smaller tributaries branching off to the left. The city is visible as a dense, light-colored area in the middle. The surrounding land is mostly green, indicating vegetation. A semi-transparent grey horizontal bar is overlaid across the middle of the image, containing the text 'PART 2 : PORTO-NOVO'. A thin green vertical line runs down the right side of the image, and a thin green horizontal line runs across the bottom, intersecting the vertical line.

PART 2 : PORTO-NOVO

1. History

Porto-Novo is one of the oldest cities in the country. Word of mouth locates the origins of the city around the 17th century. According to legend, the human settlement dates back to the late eighteenth century, with the myth of the three Yoruba hunters from Nigeria: Obagadjou, Anata and Akakpo-Agbon. One day, when they had stopped during a hunt and had rested against a termite mound, they saw a monster with nine heads who disappeared as quickly as he had appeared. Back in the village the three hunters tell their story and are enlightened that the mystery monster is Abori Messan Adjaga, a benevolent deity and protector. The three hunters then return the site to build a temple and founded Accron, a district which form a part of modern day Porto Novo.

In the eighteenth century, the Adja leave Allada, and settle near Hogbonou Akronet, (which will be called Adjatché for the Yoruba), with Té Agbanlin the third prince of the line of Agasuvi becomes their king, following this he does not hesitate in going into conflict with the Yoruba community by annexing several villages.

1.1 Porto-Novo and the Slave Trade

During the second half of the eighteenth century, eager to escape the power of the kings of Abomey, who control the slave trade in Ouidah, Europeans are turning to Porto Novo. The Portuguese settled in Hogbonou Eucharistus renaming it town Porto-Novo in 1752. Following this the first freed slaves from Brazil return and open up trading posts. These will host the bulk of the economy and the city will prosper as does Ouidah and Abomey.

1.2 Porto-Novo in the Protectorate

At the end of the slave trade, another trade in agricultural products and manufactured goods, took over and developed. The first protectorate treaty with the French was signed in 1863 under the reign of King Sodje, following the efforts of conquest of the city by the British in 1861. The second protectorate, established April 4, 1882 under the reign of King Toffa, marking the installation of the French colonial administration. The Colony of Dahomey is created and Porto Novo becomes the capital by decree on June 22, 1894.

1.3 Porto-Novo since independence

Porto Novo became independant in 1960, and is the political and administrative capital, a position it still holds today, but only symbolically. The city was stripped of its attributes of capital in the 60s and 70s with the transfer of the Presidency and the Ministries to Cotonou. With the advent of democratic renewal in 1990, the status of capital of Benin was reconfirmed. The resurgence of the city was emphasized with the implementation of a Special Rehabilitation Programme with the main objective to restore attributes to Porto Novo as capital of Benin. As part of the reform of territorial administration and decentralization, Law No. 98-005 of 15 January 1999, gives the city of Porto-Novo, as the capital, a common character with special status, 5 quarters and 86 districts.

The City Hall of Porto-Novo summarizes the strengths and weaknesses of the city in the following manner:
Strengths :

- Capital of Benin
- Economic benefits from trade with Nigeria
- Environment quality, unpolluted, along the lagoon, and very largely composed of Green Spaces
- Built Heritage (African, Afro-Brazilian colonial)
- Knowledge of quality craftsmanship, and a growing industry

Weaknesses :

- Difficulties in establishing itself as capital of the country near the economic capital Cotonou (see next page)
- Instabilities of resources from the informal trade
- Weak mobilization of financial resources
- Difficulties in collecting taxes and tax
- Inadequate urban services
- Road Network and infrastructure far below the needs of the population
- Development anarchic areas not surveyed and unrenovated
- Structure of tourist reception inappropriate



Panorama of Porto-Novo from the DPDC office - 2010 -

2. Regional role of Porto-Novo : Cotonou, the economic capital

The city of Cotonou is regarded as the economical capital of Bénin. In addition to its administrative and political buildings such as embassies and major banking groups, Cotonou is equipped with infrastructure that is very important in view of the country's economic life.

2.1 Urban growth

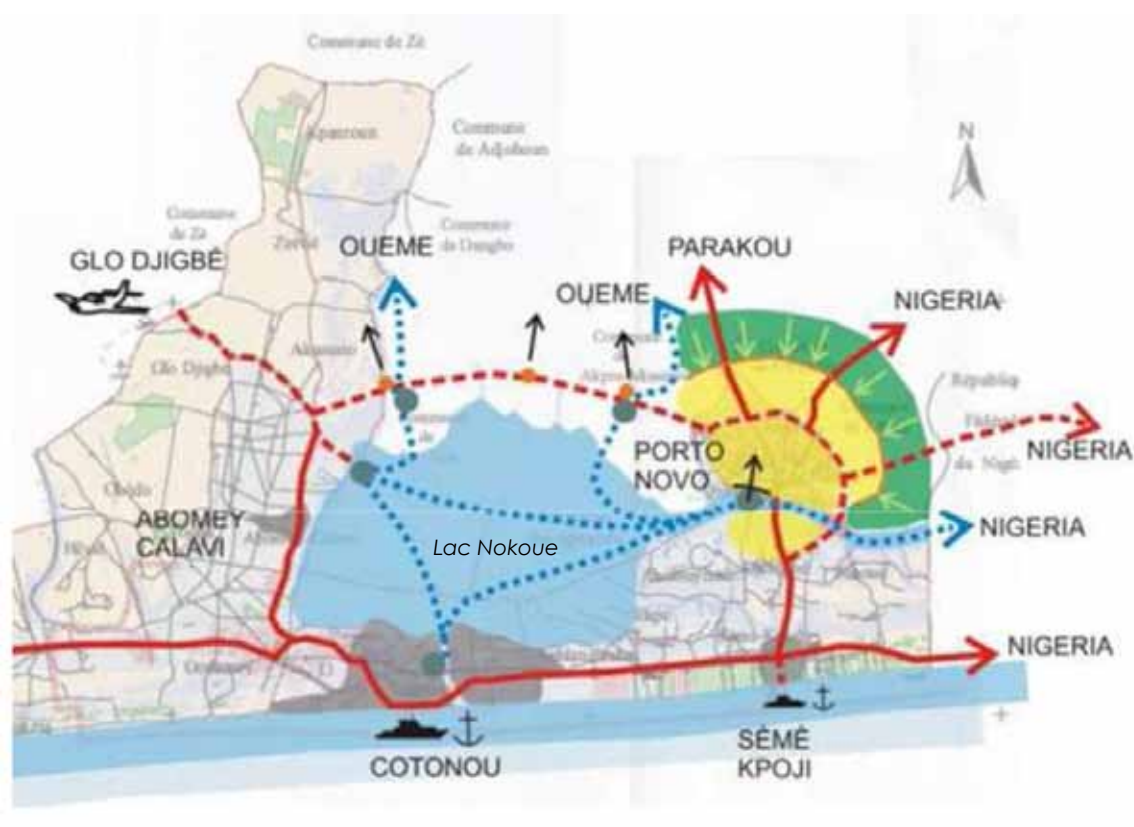
Cotonou has grown very fast. In 1945, the city was home to 18,000 people in what was in reality a large village. Ten years later there were three times more inhabitants, around 57,000 people. In 1960 the progress continued with the influx to what would become the «capital» of Benin. Migrants came from all sides, from villages, further away towns, but also from neighboring countries like Togo and Nigeria. This explains the impressive growth rate of the city until the late 1980s at nearly 8% (now the rate has stabilized at about 4%).

Currently, the city has officially 750,000 people, but welcomes every day more than a million: the role held by the agglomeration in the economy transits many merchants and sellers of many neighboring towns who come to work in Cotonou (RSS commuters).

2.2 Economy

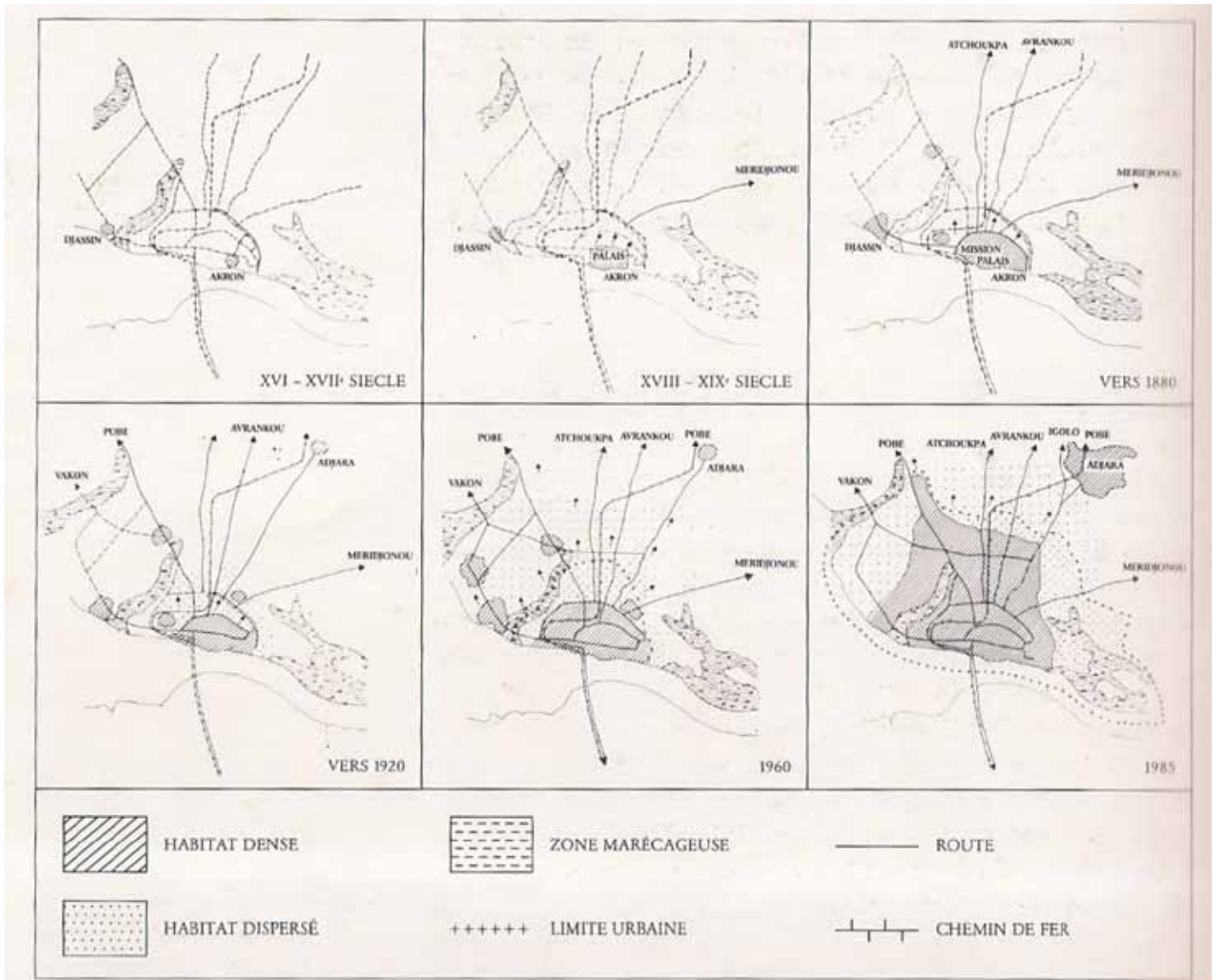
Dantokpa market is the largest market in West Africa, which covers nearly 20 hectares. TRUE?? This market serves as both a place of trade between Benin, but also a real place of exchange with other countries in Africa. The city has a large port, the true heart of the national economy, which provides an opening to neighboring countries: 90% of the country's trade with the outside world is from the city of Cotonou. The port is a key element of the city, both for its economic and commercial importance, with nearly 18 hectares of quay and 40 hectares of stores and warehouses.

Finally, another major element is the city's airport. Cotonou hosts the country's only international airport and is the focus of international air traffic.



Panorama of Dantokpa market - Mai 2010

3. Spatial organization & patrimony



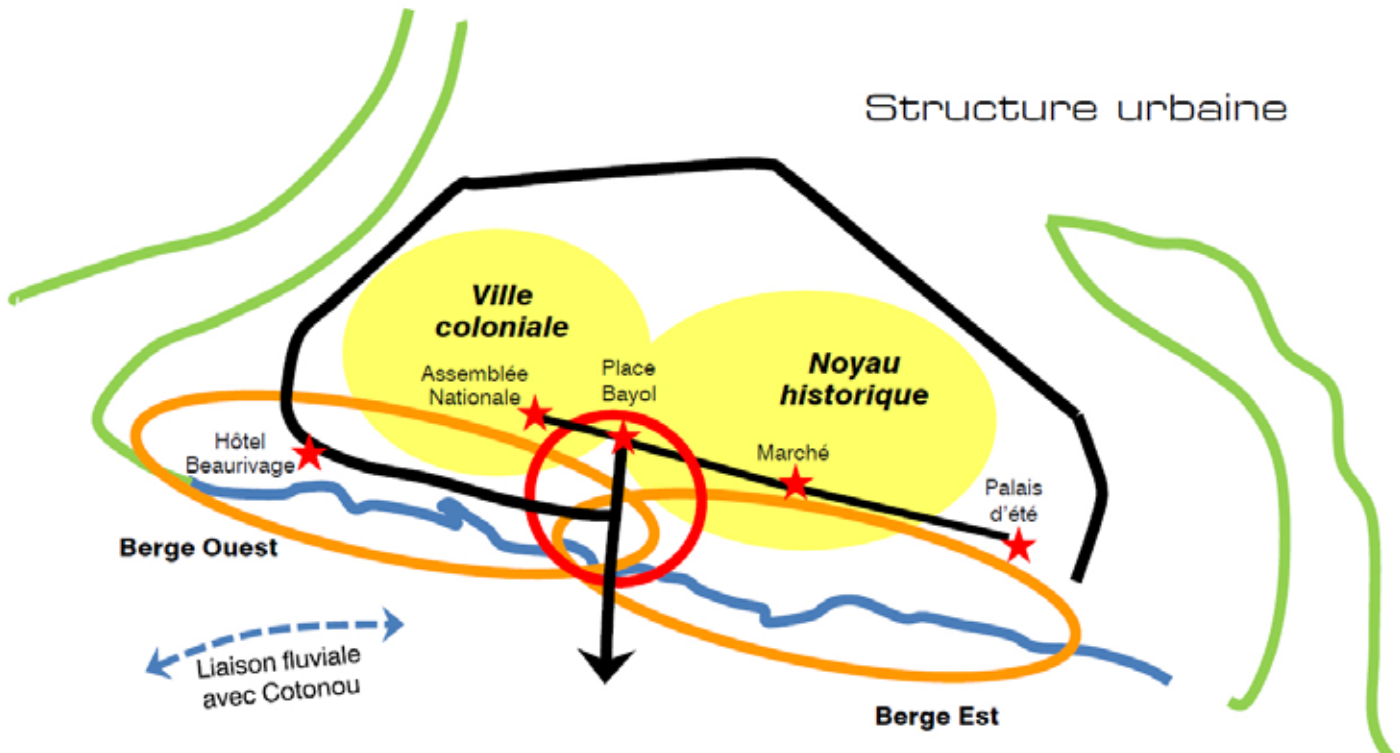
Development of the city of Porto-Novo
(Sinou, A. & Oloudé, B., 1988, Porto-Novo, ville d'Afrique noire, p.146)



Palais d'été - Summer palace of the king



Grand Marché - Central Market



3.1 Porto-Novo's urban structure

Porto-Novo has a center which is still structured and marked by its location and long history. In the south, the first edge is created by the lagoon. Because of this natural barrier, the city was forced to grow north, and remains to do so until today. In the north, the city center is bordered by the ring road (boulevard extérieur) which has been bridging the gap to protect the city during the colonial period (1940). Between these two, step by step, the city we now call Porto-Novo has grown, until approximately the Second World War, when it began to expand over the ring road.

The urban structure of the city centre can be represented by a scheme. The central axis is formed by the Ballot boulevard; the spinal system for the centre, connecting east to west, including the Summer Palace of King Toffa, the Great Market and the Bayol Square, and passing by the Governor Palace it ends at the Ring Road. Over the valley's, a large new road has been created: the Boulevard du Cinquantenaire, which encircles the city on the north and links the radial ways.

According to typical French colonial policy, the colonial city grew close to the existing historical city, with little interference, thus forming two separate urban systems. Today, the contact point between these two is the Bayol Square, in the middle of the city and a structuring point of the principal axis.



Place Bayol - Bayol Square



Assemblée Nationale - The current National Assembly

In addition, another socio-spatial system can be identified in the heart of the center: the « Capital Cube »

This example is from the workshops of 2009. The recommendations are still relevant and inspiring for the municipality which tries to follow them with some adjustments. The « Carré Capital » propose an interesting explanation of the site.

The structure of this square is delimited by the end of the bridge, the Bayol Square, the current National Assembly and the Botanical Garden, and finally by the 'allée des manguiers' (Mango trees street) which is the connection to the lagoon. This "capital cube" is the synergy of the contemporary identity of the city on a symbolic, functional and dynamic level.

Symbolic: the square links and creates a dialogue between the different functions of the city: functions as National Capital (the square of the new National Assembly), functions as Regional Capital (with the potential project of the City Services moving into the current National Assembly) and the city's cultural identity with Bayol Square and the Botanical Garden (old Sacred Forest) and the Natural Patrimony (with the lagoon connexion).

Functional: the square creates a dialog and a space for exchange between different sectors of the city centre because of the spatial connexion at the four corners of the square and on both sides of the biggest axis which connect those corners, for example the major axis between the bridge and Bayol Square (which makes the entrance of the city coming until Bayol Square).

Dynamic: It also create a major space which is easily and clearly understandable for economic, political and cultural investors.

3.2 Porto-Novo and the lagoon ecosystem

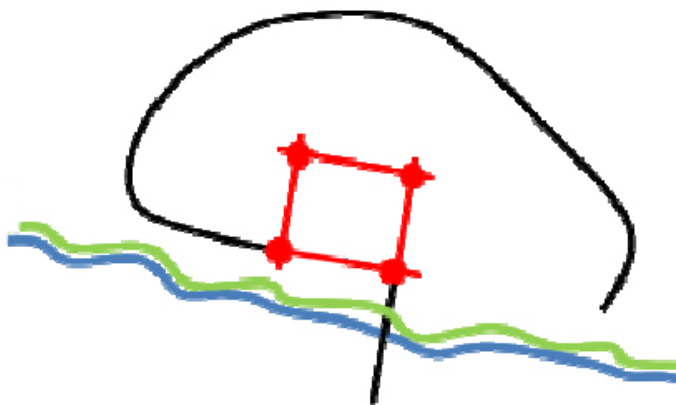
The city and the lagoon should be thought of as a holistic system: the preservation of this sensitive ecosystem and its edges is an ecological obligation because of the inundation risk (the water level is rising because of global climate change). In addition, it is very important and potentially valuable as an economical, social, urban and landscape area.

The relationship between the lagoon and the city covers a succession of strata: the lagoon bed, mobile banks and the fixed banks that serve as the front of the city, which rise up to the rest of the city and beyond. The city is naturally drained by valley's. These low-lying areas (depressions) traverse the urban fabric of Porto-Novo roughly from north to south, discharging into the lagoon.

The lagoon has a very important ecological role on several levels:

- regulation of the hydraulic flow through its storage capacity (as other wetlands)
- filter purifying water runoff
- Protection of coastal erosion through vegetation on the banks. It is a mosaic of habitats characterized by high biological production (algae, crustaceans, molluscs and fish, various associated environments, marshes, salt marshes, reed beds, mudflats, mégaphorbiaie, riparian forest or mangrove)
- reception area very important for birds (waders, ducks ...)
- home to some species that live in these environments
- The écotoniales (the ecotone is a transition zone between two ecological ecosystems) have specific functions in the fixed «ecological network» (either structure-ford, or buffer zone, including sometimes functions as a biological corridor .. depending on size and biogeographic context, and the degree of human impact.

In addition, the water of Lake Nokoué and the lagoon of Porto-Novo play a key role in food and socio-economic challenges. These water bodies serve as a habitats for local Toffin populations (local tribe) living in small towns bordering the lake, it feeds the aquifer that supplies water wells



Le Carré Capitale



Bridge over the Zounvi valley, close to Hotel Palais Oriental 2

in the vicinity, it contains important fish and shellfish for feeding people in the region, serving as means of transporting people and goods and is used to irrigate vegetable crops. But the ecosystem is threatened. The city is prone to flooding and is working on resolving this by draining the water into large underground channels which will quickly drain the water from the city. However, there is evidence to suggest that as the rainwater drainage from Porto-Novo is directed towards the lagoon, it is having a negative effect on the lagoon environment. This is mostly due to the rapid drainage run off putting excessive pressure on the lagoon system with sudden influxes of water, due to large volumes of water falling in a short space of time. In combination with dumping and drainage of pollutants into the lagoon the water quality of the lagoon is seriously affected. In addition, processes such as sand extraction from the banks making the fringes of the lagoon more unstable and prone to flash-flooding.

Often the city of Porto Novo and it's landscape have been viewed as two separate entities. However recently, as the understanding of the environment we live in and the complex systems associated with it becomes greater, the idea that the city and its lagoon should be thought of as a holistic system is gaining ground. A balanced relationship should be established, which ensures that development and growth of the city is enabled, along with the preservation of the long term quality of natural heritage and landscape. The lagoon is a large part of the local identity of Porto-Novo and local populations developing a respect for the lagoon is key to fulfilling the best interests of the town, it's community and the environment.

The municipality of Porto-Novo is aware that the lagoon is a major asset which should be used to its full potential (environmental, landscape and economic). The Mayor's vision is, on the one hand to prevent uncontrolled (invasive) plant populations in sensitive areas (to prevent flooding after the installation of populations), and on the other to prevent human pressure on the banks of the lagoon. It is therefore to preserve or rehabilitate biological resources (bicénose) and limit the deterioration of the physical environment (biotope).



View onto the Lagoon

3.2 Porto-Novian zones and architectural heritage

Porto-Novo is a city with architectural heritage of a very high quality, shaped by the different eras that have marked its urban development. Today, we can characterize the space of Porto-Novo in four major morphological zones, which largely correspond with the different phase of history of the city, marked by different powers, ethnic groups and stories. Those zones are the historical oldest center, the Afro-Brazilian center, the colonial center and the north of the city, younger than all of the other one and presenting quiet the same architectural and urban structure.

This zoning is however a generalization of reality. There are large concentrations of Afro-Brazilian houses in the Oganla neighborhood, but you can find some houses in the old center as well. And before the development of the city and its urbanization, the changes that have taken place in the so-called 'ideal of living' since the 1950s, caused fractures in the morphological zones. A common pattern is that when old houses fall into disrepair, they are reconstructed according to a «modern» model or a subjected to partial changes.

In the east, the old center

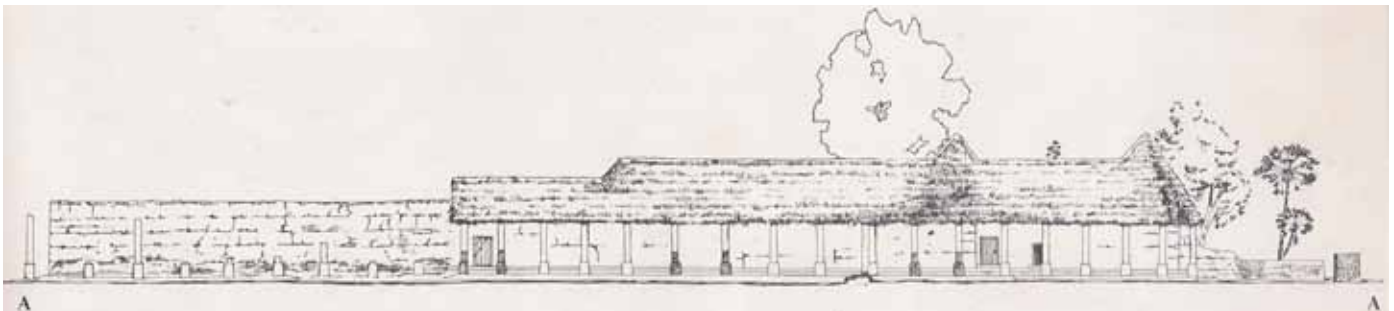
This area reflects the architecture of the pre-colonial era, when Porto-Novo underwent a period of growth registering among the generation of cities adjacent to the Yoruba palace. The city-kingdom was founded in 1688 by the Adja from the kingdom of Abomey (supposedly there because of a quarrel within the palace and the desire of a prince to come to power). At that time, there was already a human settlement on the site. However, the arrival of the Adja launches the founding of a city-state, with a high level of organization. The type of urbanity that develops at that time is organized by the hart of power and the center of trade: respectively the Palace and Market, which are the two hearts of the city, surrounded by fortifications. At those times, the city is punctuated by the clock of the voodoo rituals.

Among the most important buildings of the old center are the Royal Palace (now the museum Honmè) in the Avassa district, the Summer Palace of king Toffa (Gbekon district), the palace of Akron, one of the Akplogan (Agbokomè district), the palace of the Minister Gogan (Togoh district) and finally the palace of the «kings of the night» to Zounon, in the Zebou district). These palaces structure the city. They are the marks of royal powers that flourished in ancient Hogbonou (Adjatchè called by the Yoruba) since the founding of the city Adja.

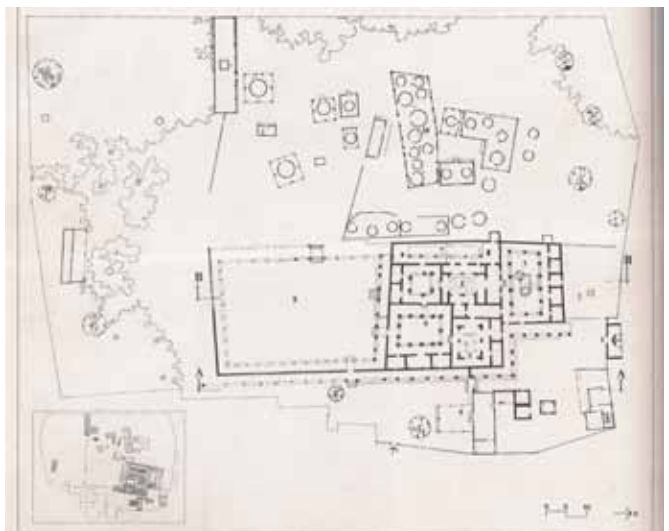
The center is also the site of the oldest market of the city, Central Market (Oja Eru) where slaves were sold. The old market Oja Omon (children's market), can still be found opposite the Royal Palace.

Finally, the center is punctuated by numerous Voodoo temples with central deities, gods that protect an entire neighborhood, and the deities of the ancestors.

The circulation plan of the area is characterized by many pedestrian areas, within large blocks, houses typically being constructed from clay bar. However, in 1972 large areas were cleared to create trunk roads to promote the opening of the neighborhood to traffic.



Vernacular architecture : Royal Palace, now museum Honmè



Map and section of the Royal Palace (Sinou, A. & Oloudé, B., 1988, Porto-Novo, ville d'Afrique noire, p.54)

It should be noted that the vernacular architecture found in this area is also found on another site, west of the Colonial zone, in our study area. This is the area of the Migan, organized around the Tree of Justice and the Palace of Migan (See 3rd part).

Both houses as well as palaces are traditional organized around a courtyard, because of the family relationships of their occupants. This 'empty space' is a place to live and perform livelihood activities: cook, wash, odd jobs. It's also a place of socialization.

At the neighborhood level, the organization of buildings around an empty space is also found. The neighborhoods are well organized around semi-public places (Honto) on which we find different vendors, who chat while keeping an eye on the children playing nearby. Moreover, this is where social events are held, such as the celebration of a baptism or funeral, as well as the voodoo rituals that punctuate Hogbonou.

Often, these places have been intersected by streets and roads which are added at a larger stage. But when a ceremony takes place, these areas are reclaimed for temporary private use. That's why sometimes (especially on Wednesday, Saturday and Sunday night) you will see a street, blocked by a tent. There is a collective memory of the place.

The centre, Oganla

In 1752, the Portuguese were the first Europeans to settle in Hogbonou. The Portuguese colonization in Africa was often focused towards conquering and safeguarding areas to promote remote trade relations, with little political interference. From 1782 the city was named Porto-Novo.

Between 1820 and 1835, former slaves, free since 1807 (the year of the abolition of slavery in Brazil), start returning to Porto-Novo and settled there. This wave of arrivals has strongly marked the city. First, the composition of society gradually changed. Afro-Brazilians have brought with them their last names (such as Diaz and Da Silva), ways to eat (at the table for example), talk and dress. They also brought Christianity with them, and certain ceremonies connected with the commemoration of anniversaries of ancestors, or processions, which are still practiced today. They brought with them the apprenticeship system and the system of placement of the child.

They were enriched in trade (including slave trade) and quickly became the commercial and merchant elite of the city. Because they represented an elite, some tried to imitate them. There was a French family, that of Olivier de Montaguierre, which changed its name to De Olivera. And then, when the French protectorate was signed, and the French became an elite, a branch of De Olivera changed their name back to Montaguierre.

Traces of their activities still remain. In the collective memory, Afro-Brazilians continue to be perceived of as slaves' traders and were denied from political office. They have had a lasting impression on the Gon-Yoruba society.



Afro-Brazilian style architecture : now museum da Silva

Example of a concession of Afro-Brazilian houses (Sinou, A. & Oludé, B., 1988, Porto-Novo, ville d'Afrique noire, p.77)

They also left physical traces. In the west and northwest of the old district the Afro-Brazilian neighborhood unfolds. It is located roughly along the old road of the slaves, which runs from the North to Central Market (former slave market). The Afro-Brazilian neighborhood is characterized by multi-storey houses, built of earth or clay brick having decorations around the doors and windows which are highly regarded. The architecture is often described as being made of a series of rooms that sometimes open to long galleries with archways decorated with cornicing and decorative moldings, alternating with Corinthian columns. (Guide definition of cultural landscapes in Porto Novo, 2001 edition). Because of the richness of Afro-Brazilian families, their houses are often large.

Today, many Afro-Brazilian homes are severely degraded. The Heritage House is seeking to develop rehabilitation and restoration operations to preserve this heritage. However, the difficulties are numerous (see interview with Dr. D. Houenoude).

The West, The Administrative Zone

The French protectorate was signed in 1894, creating «The colony of Dahomey and Dependencies» (Porto-Novo and Abomey), under the authority of Victor Ballot.

Despite the already existing settlement, or perhaps because of it, the colonial government built a city next to the city, a common practice in French Colonization. The installation of screening services (trade and territory) led to an area which is now known as the 'administrative area'.

This area dates back to 1890-1900, and has grown until the country's independence in 1960. The French created wide avenues, planned for the use of cars, bordered by trees providing shade. To be able to build in this area, the trees of the sacred forest of the king of Porto-Novo had to be cut down.

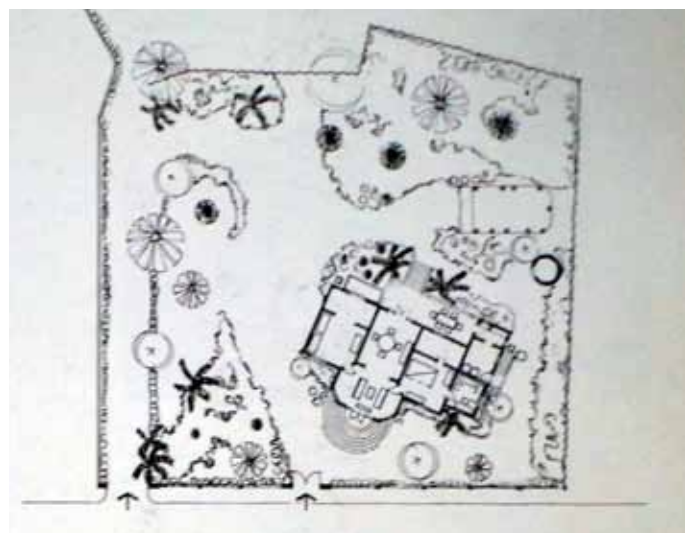
Colonial houses in the area are characterized by their galleries and large windows, which can be closed by venetian blinds for comfort. High ceilings promote air flow, creating a comfortable indoor climate.

Public building (postes...), shops and colonial French houses serving as residences for officials, often close to the lagoon, developed during this period. In most cases, trade or activity took place on the ground floor and the owner or manager was living above them. This was also the case at the National Assembly, where the governor had his apartment above his office himself.

Today, the majority of these buildings became the headquarters of various authorities. In the administrative area the following functions can be found: the headquarters of the National Assembly (Former house of the Governor), the Ministry of Education or of Security, Béhanzin high school, the Court of Justice, the Teaching College, etc..



Colonial style architecture : the school for African Heritage



Exemplary map of a Colonial logement (Sinou, A. & Oloudé, B., 1988, Porto-Novo, ville d'Afrique noire, p.125)

The North, The Upper part of Town

This extension of the old city to the north, beyond the ring road (which took place of the old city wall in 1940), extends upwards on a plateau reaching over 29m. These buildings all date from post 1930, and were constructed after the amalgamation of surrounding villages (and their agricultural lands). They were often built by newcomers commonly on a modest income, houses in this part of town adopt a simple, linear style, where a series of room connect to each other in a band. They are also mixed with wealthier properties, which often belong to successful Yoruba traders.

The old city increases on the North, after the Boulevard Extérieur and in direction of the highest part of the city (around 29 m above the sea level). The buildings were build after the 1930's and have been made by surrounding and integrate the closest villages. The houses there are primarily build and owned by new and often poor citizens, so they are simple in a style linearly called in which the rooms are like stuck to the others in a tape. They are mixed in the streets and neighborhoods with richer houses, often owned by Yoruba rich merchants.

Social mix of the districts of Porto-Novo

Porto-Novo's urban housing is mostly characterized by mixed housing in a same neighbourhood. So you can find traditional houses in bricks or in bamboos, as well as modern houses in briks or concrete. The houses are structured in familial concessions mostly in the first grown areas (1st and 2nd districts) although the rest of the city is mostly constituted by villas and lots.

The city centre has a good electricity and water network but for the rest of the city, that concern just the biggest axis.

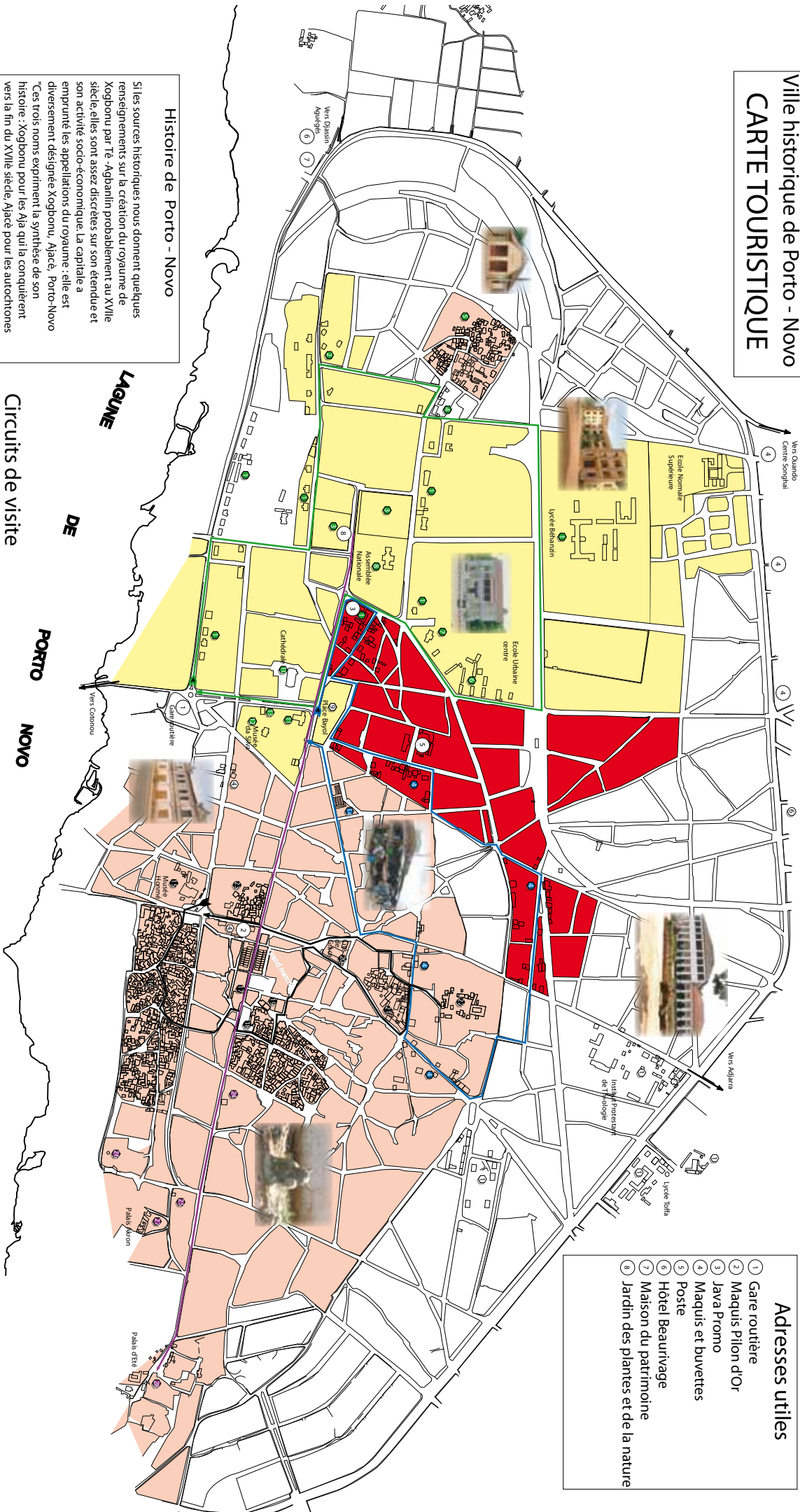


Modern house in Ouando



Ville historique de Porto - Novo

CARTE TOURISTIQUE



- ### Adresses utiles
- 1 Gare routière
 - 2 Maquis Pilon d'Or
 - 3 Java Promo
 - 4 Maquis et buvettes
 - 5 Poste
 - 6 Hôtel Beauvillage
 - 7 Maison du patrimoine
 - 8 Jardin des plantes et de la nature

Histoire de Porto - Novo

Si les sources historiques nous donnent quelques renseignements sur la création du royaume de Xogobou par Te - Agbanlin probablement au XVIIe siècle, elles sont assez discrètes sur son étendue et son activité socio-économique. La capitale a emprunté les appellations du royaume : elle est diversement désignée Xogobou, Ajacé, Porto-Novou "Ces trois noms expriment la synthèse de son histoire : Xogobou pour les Aja qui la conquièrent vers la fin du XVIIe siècle, Ajacé pour les autochtones qui accueillirent ces Aja, et Porto-Novou pour les Portugais qui débarquèrent dans la deuxième moitié du XVIIIe siècle. Dominant sur la lagune avec ses vieux quartiers, les maisons afro-brésiliennes, les marchés, des constructions coloniales..." de fondation ancienne et riche de traces de son passé, c'est une ville qui attire immédiatement avec la variété de son tissu urbain, mais qui se révèle peu à peu dans sa complexité et sa richesse..."

- ### Circuits de visite
- A travers le quartier colonial** (Départ et arrivée gare routière)
 - 1 Ensemble de bâtiments administratifs coloniaux
 - 2 Jardin de Plantes et de la Nature
 - 3 Ensemble de maisons afro-brésiliennes
 - 4 Quartier du Migan
 - 5 Ecole Urbaine Centre
 - 6 Musée Ethnographique
 - 7 Assemblée Nationale
 - A travers le quartier afro-brésilien** (départ et arrivée place Bayol)
 - 1 Place Bayol
 - 2 Cathédrale
 - 3 Maison Intentionnelle de la Culture
 - 4 Musée Da Silva
 - 5 Douane
 - A travers le quartier ancien** (Départ et arrivée Musée Hommé)
 - 1 Musée Hommé
 - 2 Coeur historique de la ville
 - 3 Grand marché
 - 4 Place et collectivité des 13 lignages
 - 5 Mosquée centrale
 - 6 Temple Cité de Grace
 - 7 Collectivité des forgerons "Dakrogan"
 - 8 Palais Sadognon
 - 9 Palais du ministre du culte "Aklogan"
 - Le long de "l'axe du pouvoir"** (Départ JN ; arrivée palais du Roi Toffa)
 - 1 Temple Elefja
 - 2 Temple Awessan
 - 3 Temple des Trois Chasseurs
 - 4 Palais Akon
 - 5 Palais d'été du Roi Toffa

Les Ateliers: Can you briefly introduce Heritage House?

Didier Houenoude: Heritage House in Porto-Novo opened its doors in 2009, just south of the large market. It comes from a rehabilitation program conducted by the School of African Heritage (EPA) in 2007. To date, EPA has identified 500 items of heritage in the historic center of the city. Among them, 400 houses Colonial style, Afro-Brazilian or vernacular, of which 100 are in very bad condition.

Thanks to financial support of Greater Lyon the house (where they are based) has now been renovated where previously it was almost in ruin. The operation was conducted in partnership with the family that owns the house following the Greater Lyon funding the work to begin. Once restored, the house was rented to the town hall. The family then receives a rent, half of which is used to reimburse the costs of rehabilitation which will last for around 15 years at today's rate.

Les Ateliers: What are the tasks of Heritage House?

D.H: There are about three main tasks:

1) Backup and Protection: Identification of ruined houses, establishment of preventive measures (redo roofing, windows, doors) especially for protection during the rainy season.

2) Development: To local people our heritage is often seen as a sign of poverty and they prefer to build with modern (brick / cement). We must educate people so they recognise the significance of the old and make people realise it fits into modernity. To do this, we work with two organizations: Alliance for the property (consisting of homeowners Heritage) and U Houedouto (community leaders who are a moral society and can be a good link with the people).

3) Wealth Management: How to restore this heritage? We can not transform all homes rehabilitated into a museum. Our proposal is to work with owners to ensure that the renovated buildings become guest houses, the rates can be used to maintain these homes. We also propose to set up exhibitions in several home at the one time.

Les Ateliers: Where does the money come from?

DH: The money comes from the City Council but we don't have our own budget. Each project must submit documentation to the City Council who may accept or refuse the application. There are also external partners. For example we are working with an Italian decentralized cooperation for the rehabilitation of the axis that goes from Place Bayol to the Palace of Governors (now the National Assembly), which is an axis of old power (Royal) to the colonial power. There are also plans for books with the Greater Lyon and Brazil. Finally, UNESCO also supports us through letters of recommendation.

Les Ateliers: Is the goal to get the city to the World Heritage status?

DH: Yes, certainly, but we know it will be very difficult to achieve. It takes a lot of work to raise the awareness of local people. It is a condition that is more than necessary. Further more there is a lack of regulation in the city to protect the historic center. Finally, at present there is not enough dialogue between the city and the government who owns most of the colonial heritage.



Heritage House - South of the Great Market



A house with character in the center, damaged by the time

4. Population & Urban Growth

The population of the town of Porto-Novo is now estimated at about 250,000 inhabitants, spread over 52,5km² (0,05% of national territory). In the last census in 2002 there were 223,552 inhabitants, 52.5% women, 46,000 households, according to the following distributions (figures RGPH 2002):

Ethnic Breakdown

Ethnicity	Gouns and Fons :	Yoruba :	Adja, Mina, Wémè and Toffin :
%	66%	25%	7,9%

Religious distribution

Religion	Christianity	Islam	Voodoo	Traditional	Others	None	unknown
%	62,3%	25,1%	4,7%	0,4%	2,2%	3,2%	1,8%

Breakdown by age

Age	0-19 years	20-39 years	40-69 years	> 70 years
%	51,3%	31,1%	15,3%	2,4%

Urban growth

In the 60s the city has undergone an extension on certain neighborhoods surrounding the ring road (Kandevié, Foun-foun, Avakpa ...), before urbanization from spreading into areas further afield (Dowa Louho, Gbodjè ...). The city now covers an area of 53 sq km, with a growth rate of 2.6% per year.

Between the censuses of 1992 and 2002 the average annual growth rate of the city was 2.4%. This increase varies greatly according to the districts and their density:

Borough	Population		growth
	1992	2002	1992/2002
1	34 553	35 914	0,4
2	35679	45 333	2,4
3	31 004	31 894	0,3
4	44 246	57 678	2,7
5	33 656	56 193	5,3
Total	179 138	227 012	2,4

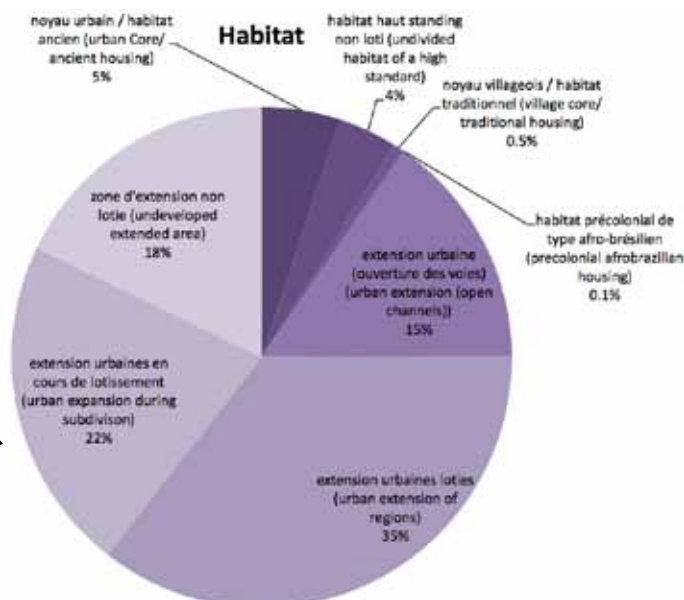
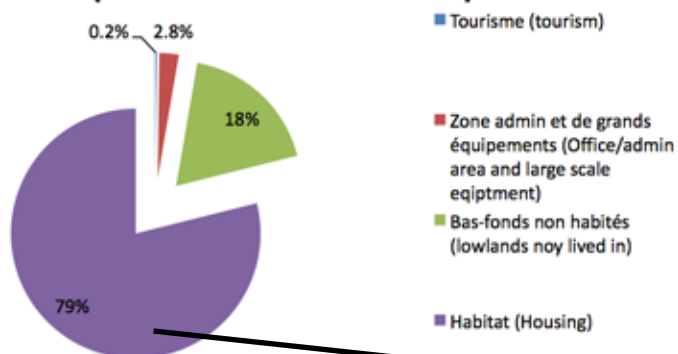
According to the different population projections conducted by INSAE an estimated population of Porto Novo in 2019 will amount between 351,000 and 323,000 inhabitants, with a projected average of 339,700.

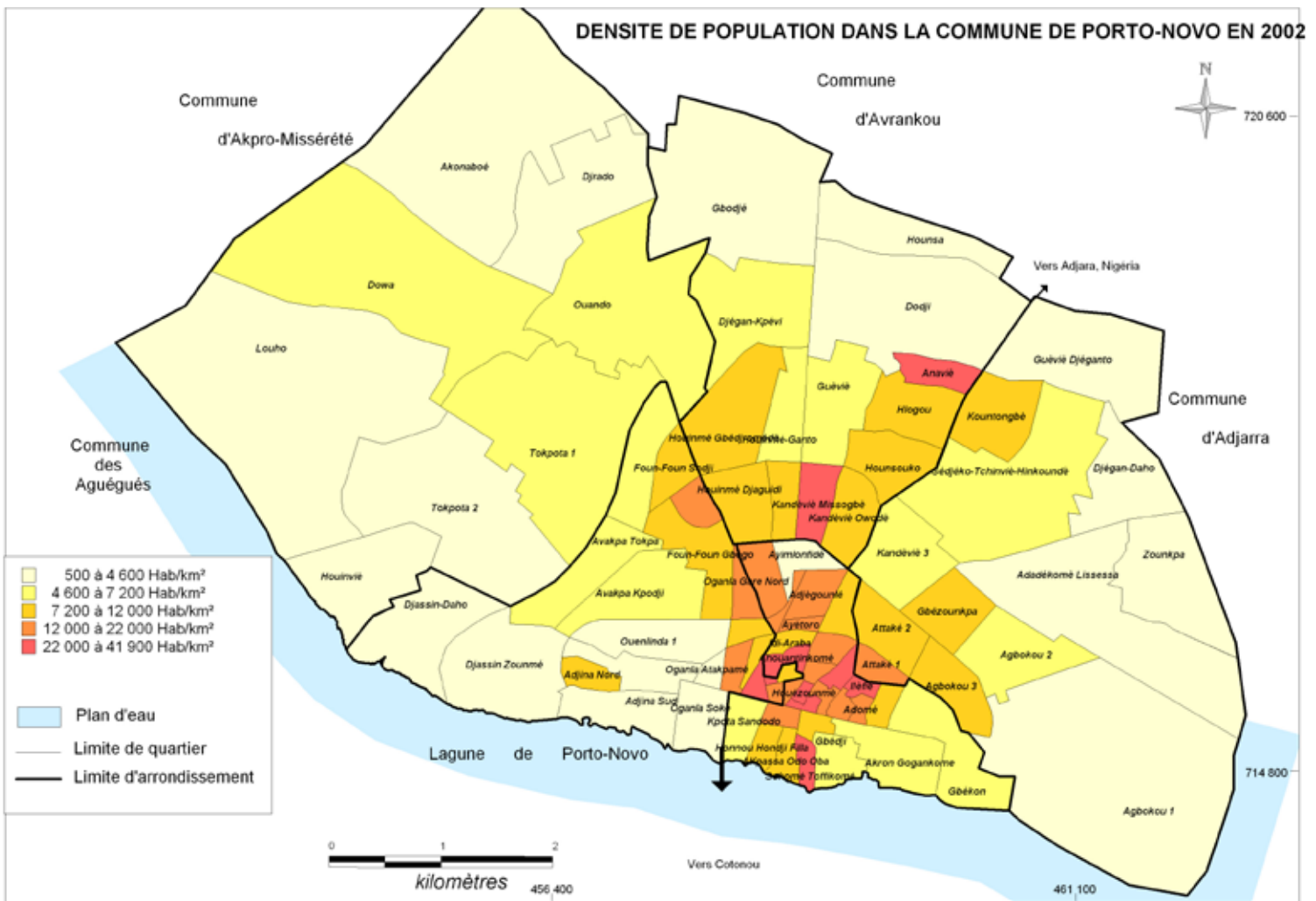
Land Use & Density

The population density varies widely by district of Porto-Novo. In the older neighborhoods of the city center, it can reach 224 persons per hectare, against 107 in the first expansion zone, and 30 in fringe neighborhoods. On average the city has a density of 53 inhabitants per hectare translating to 530 inhabitants per sq km.

Thus the urban fabric is largely characterized by a spontaneous occupation of the peripheral areas beyond the administrative boundaries of the city, but this area has experienced in recent years a certain density, especially in the northern suburbs, where solid structures have multiplied.

Occupation du sol - Land occupation





2002 - Population density

5. Economy

3.1 Characteristics

The city of Porto-Novo is not characterized by a precise economic specialization. It is, above all, abundant in popular and traditional business. With the textile and livestock trade possessing over 20% of the workforce. Generally, street vendors scattered on sidewalks, markets and public places account for 44% of retail establishments (in 1992), seulement 18 cons, HUH? 5% of truly sedentary activities.

Economic activity is also characterized by the so-called extra-legal activities. A good example of this, is trade in (more or less) legal hydrocarbons with neighboring Nigeria, which dates from the oil boom of 1973 and has subsequently benefited greatly from the expansion of the urban area.



Hydrocarbon in Tchinvé



Scrap yard in Koutongbé



Carpentry in Ouando

Urban agriculture, crafts (blacksmithing, carpentry, woodworking, pottery, basketry) are also an important part of today's economy. Major industrial activities are largely unrepresented in the area and register only 5% of economical activities. The major units that exist in the area include a soap factory (IBCG), a production plant Nina Wick and Fuse, a large scale printer of school books, a few bakeries, foundries and industrial processing units of agricultural products. These production units often both lack technical know-how and the capital for development.

2.2 Economic repartition

In 1992, when the last census of economic activity in the city (PEESI) was carried out, the activity was divided as follows:

Sector	Production	Services	Commercial	Total
Employees	10 367	20 109	21 525	52 000
%	20%	39%	41%	100%
Establishments	2 753	7 946	14 111	24 810
%	11%	32%	57%	100%

It also notes that (PEESI 1992):

- The informal sector employs more than 93% of the workforce
- The economic activities are largely dominated by women who run more than 56% of business establishments
- And by the young, with 54% of heads of businesses and services under the age of 30
- The public sector occupies 26% of the workforce

2.3 The major markets of Porto Novo

The City of Porto Novo has a number of markets divided into three categories of importance, most have undergone major upgrades in recent years:

Regional Markets:

- Market Ouando (agricultural products ..) emerged as the main market of the city
- Central Market / Large Market: fabrics, manufactured goods

Secondary markets:

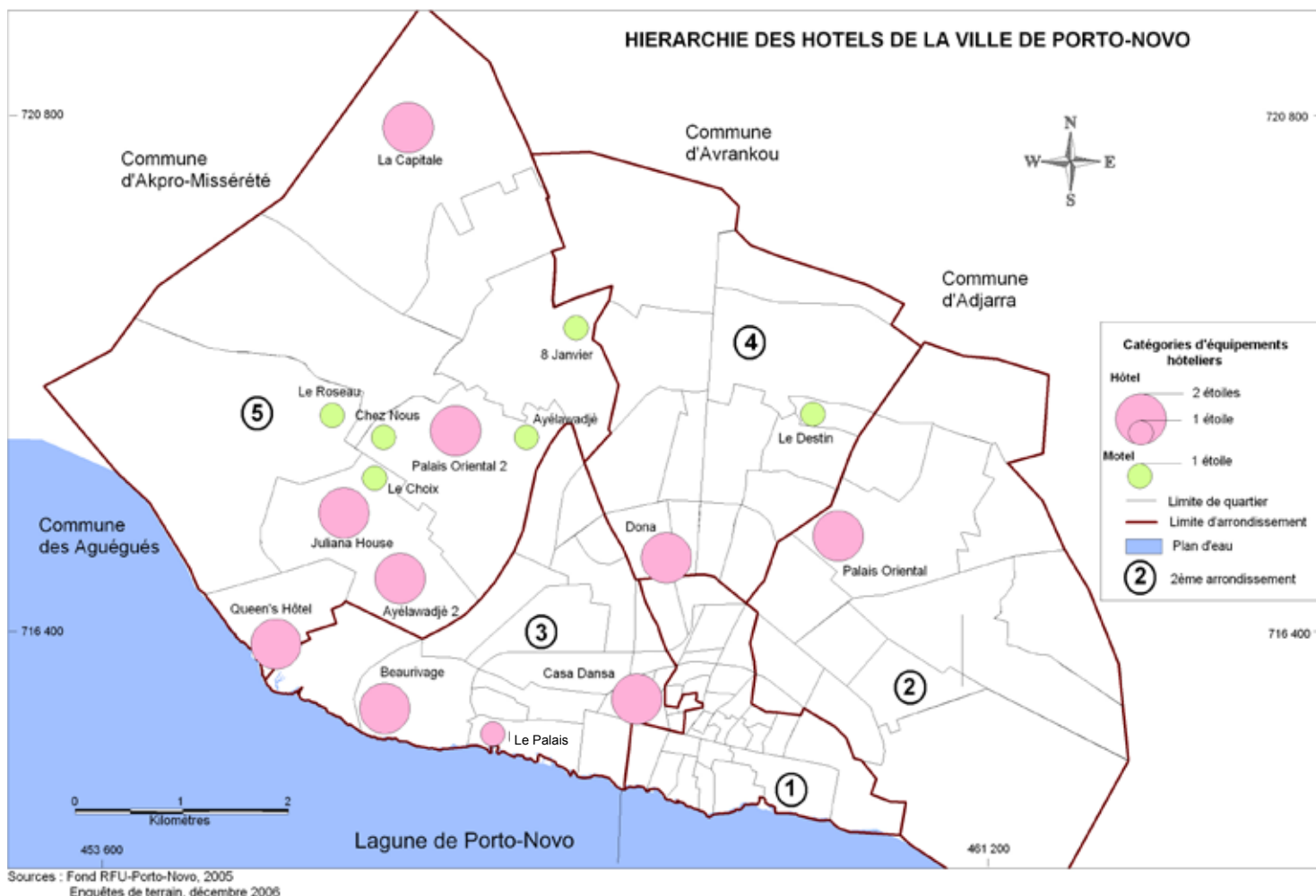
- Djassin Market: Agricultural & Fish Products
- Market Gbégo: electrical products and appliances
- Market Djégan-Daho: agricultural products and fish
- Agbokou Market: Agricultural produce
- Market Ahouangbomé: food products and manufactured goods

Street markets: Dondo, Kandevié, dégué-Tokpa Markets

Despite some development of the two main markets of the city, Porto Novo's markets are vastly inferior to Dantokpa market in Cotonou. It is indeed the largest market in West Africa and trades nearly 1 billion CFA francs of products per day.

2.4 Tourism

Porto-Novo could be a highly touristic city because of its architectural heritage (see chart on this subject), but also as a business center, and political capital of Benin. Yet this is not currently the case. Despite a range of hotels establishing in the area the city is still not equipped appropriately with adequate facilities, and access to sites of interest is often difficult, with them being severely undervalued locally.



Hotels in Porto-Novo

2.5 Urban Agriculture in Porto-Novo

According to the plan of campaign Agricole (2004-2005), agriculture employs 13% of the workforce in Porto-Novo, or 2976 people and 1332 households.

Agricultural production

It represents an area of 710 hectares (14% of the area of the city), and is divided as follows :

Type	Size	Quantities Produced	Comments
Tuber	176 hectares	247 tonnes	91% Cassava, 9% tuber
Market Gardening	173 hectares	1137 tonnes	
Cereales	248 hectares	285 tonnes	
Leguminous	114 hectares	41 tonnes	63% Cowpea, 37% peanut

Livestock

Livestock production is broadly in Porto Novo, but it is poorly controlled. In 2005, flocks are estimated at:

Cattle	1 600 têtes / heads
Sheep	1 200 têtes / heads
Goats	9 000 têtes / heads
Pigs	7 000 têtes / heads
Poultry	30 000 têtes / heads
Rabbits	8 000 têtes / heads
Cane Rats GRASSCUTTER?	1 500 têtes / heads

Fish Production

Because of its location on the edge of the lagoon, the city of Porto Novo has always had strong fishing activity, complimented by so-called continental fish farming in pens (the acadja), related to the characteristics of sandy clay the lagoon and its shallow depth (usually not exceeding 1.5 m). This activity would hold 5,500 people (professionals and seasonal) at the start of jetties that are spread throughout the city and including Lokpodji.

The number of Fish Pond's currently were estimated at 150 in 2006.

CONCLUSION

Strength of urban agriculture in Porto-Novo:

The presence of the lagoon and various water bodies

The Songhai Center, a reference in the development of agricultural technologies and the entrepreneurial spirit

Greater regional market Ouando and the fruits and vegetables market in Ahouangbomé Near Cotonou and Nigeria

Weaknesses of urban agriculture in Porto-Novo :

Lack of agricultural land and land tenure insecurity

Reduced soil fertility and vegetable flood sites

Lack of organization of industry, technology and equipment suitable

Difficulty of survey to credit

Weaknesses in fisheries and aquaculture in Porto-Novo:

Flooding of water bodies by water hyacinth

Overexploitation

Shoreline erosion, pollution, silting



Cornfield Koutongbé



Semi-free goats in town



Entreprise at Koutongbé



Fish ponds on the edge of the lagoon, just outside of the city

1. Political and Municipal Management

As part of the reform of territorial administration and decentralization, Law No. 98-005 of 15 January 1999 gives the city of Porto-Novo, as the capital, a city of character with special status with 5 boroughs and 86 districts. The districts are not legally or financially independent.

The city is administered by a council of 33 advisors headed by the mayor, who is assisted by three deputies who can receive a share of delegation under provision of the Act. He is represented in each borough by a district head who coordinates the activities of sub-municipal services.

The Mayor also has a team, and a general secretary, which includes three directions Techniques:

- The Department of General Affairs, Development and Cooperation (DAGDC)
- The direction of technical services (DST)
- The Directorate of Financial Affairs (DAF)

The latest (and second) Municipal elections were held in 2008, and resulted in a new mayor in office: Mr. Océni

Urban planning documents

The urban planning documents on the common Ouémé area are:

- Communal development plans of municipalities;
- Urban Master Plan of Porto-Novo;
- the development plan of the banks of the lagoon and other orientations of the special program of rehabilitation of Porto-Novo;
- the master-plans of the municipalities of the department
- the master-plan for Grand Cotonou includes the cities of Cotonou, Abomey Calavi, Ouidah and Seme Kpodji Porto-Novo (DUA);
- the proposed territory of the country Gun (DAT);
- the urban development strategy of countries Gun (Cities Alliance)

In addition, the city of Porto-Novo is the subject of different studies :

- Thoughts expressed during the workshops of urban design with Les Ateliers de Cergy-Pontoise.
- reflections emerged from studies on the rehabilitation of the historic heritage of Porto-Novo (study commissioned by the SERHAU-SA, conducted by the Ecole du Patrimoine Africain).

In addition, the common Oueme area are gathered within the community of the common Ouémé and are working to promote tourism in the department.

The Master-Plan for Urban Planning and Development: SDAU

The name «Greater Cotonou» means the metropolitan cities including Cotonou, Ouidah, Abomey-Calavi, Seme-Kpodji and Porto Novo. The goal of this project is to decongest Cotonou. The SDAU account on a development of surrounding communities, which necessarily involves the urban development of these small towns. For now, the approach summerises itself with infrastructure and subdivisinal operations at Seme-Kpodji and Abomey-Calavi.

The Master-Plan for Coastal development : SDAL, established by ABE

The scope of action defined by the SDAL concerns the entire coast of Benin. It covers an area of 8700 hectares, in thirty municipalities and extends to inland for 50 km beyond «the zone of influence for oil.» Relying entirely on the guidelines prescribed by law in 2001, this document is intended as a basic action plan in terms of management and planning. Indeed, it is expected that once the SDAL is clearly identified and implemented, all the planning documents from Benin are consistent with it. It takes into account current issues along the coast at present, including: erosion, uncontrolled and illegal occupation of land, pollution, uncontrolled development of coastal tourism or the degradation of the environment.

This document presents a double interest: firstly, it will support and acknowledge coastal erosion detailing causes and outlining potential lines of action to combat this. On the other hand, it will further plan the organisation of coastal areas and propose, by zone, a development and management strategy.

Land rights and issues

The Land

The land in principle belongs to nobody outright. There is only the right of usage. Especially in the savannah, no one can occupy any land without first having customary permission. The head of land, generally from the line of the first settlers who cleared the land, is responsible for its allocation. Any new installation requires the agreement of the spirits of the place and, often, the new proposition is accompanied by an offering.

The city of Porto-Novo does not have a guidance document for management of space. There is no specification or real estate policy. There are no lines of actions by the state to organize how to access to land, the terms of ownership and security of rights over them. The demographics are increasingly strong in Porto Novo, putting pressure on not yet occupied spaces in the outskirts of the city. A structuring operation has been undertaken for Lokpodji (at present it is a fragmented area, not serviced for the building of housing) including infrastructure and subdivision of land.

Building permits

Different regulations apply and records of building permits are:

- Law No. 87-015 of September 21, 1987, relating to the Code of public health;
- Decree No. 2007-284 of 16 June 2007, regulating the issue of building permits in the Republic of Benin;
- Order No. 0019/MUHRFLC/DC/SGM/DGHC/DCPML/SA of March 27, 2009, defining the minimum requirements to be observed for the issue of building permits;
- Interministerial Order No. 0022/MUHRFLC/MS/MISP/DC/SGM/DGHC / DHAB / DGNSP / DCPML / SA on 1 April 2009 laying down detailed rules for implementation of Decree No. 2007-284 of 16 June 2007 laying down and regulating the issue of building permits in the Republic of Benin;
- specific regulations of urban planning documents (master planning and urban design, urban planning and retail) where such documents were relevant;
- construction rules in force in Benin.

NB: We have copies of these texts except the first.

2. The City Council's budget management 2009

2.1 The Operating Budget

TAKINGS

Forecast revenue: 3.1 billion Frcs CFA, including:

Taxes: 80%

Income from services and sales of various fields: 16%

Endowments, grants and equity: 3%

Other products: 1%

On 31/12/09, the revenues accumulated to:

2.557 billion Frcs CFA

We therefore obtain the **rate of recovery** following:

Taxes: 61.48%

Income from services and sales of various fields: 53.8%

Endowments, grants and equity: 364%

Other products: 77.36%

Global: 69.41%

EXPENSES

Estimate: 3,100,000,000 CFA Frcs

Implementation rate of 56% to 31/10/09

Major expenditures:

Balance of reimbursement of a cash advance granted by the State in 2006: 62.5 million Frcs, CFA

Personnel Expenses: 241,300,000 Frcs of CFA

Outside services: 460 million CFA Frcs

Purchase and inventory change: 82.7 million Frcs CFA

Transportation allowances: 2.2 million Frcs CFA

Other expenses: 235.5 million CFA Frcs

2.2 - The Capital Budget

TAKINGS

Forecast revenue : 1.26 billion CFA francs

Takings to 31/10/09: 265 million CFA francs

Reasons given: people are not prompt to pay their taxes.

EXPENSES

To 31/10/09: 265 million CFA

2.3 Expenses

In 2004, expenditures of the town hall were organized as follows (figures PDM 2005-2009):

Nature of expenditure	Amounts (CFA FrCs)	%
Administration operation	548 million	24,9%
Maintenance and other	648 million	29,4%
Route drainage	379 million	17,3%
Social and community buildings maintenance	264 million	11,7%
Garbage collection	82 million	3,7%
Security expenditure	4,5 million	0,2%
Other relevant expences	282 million	12,8%
Total	2,2 milliard	100%

In 2010, the quantities mentioned in the constitution of the budget are quite similar to those of 2009. But they draw from the lessons of the previous year. Here are some estimates of investment related to the planning and management, as follows:

- Compensation for homeowners and property of Independence Square: 150 million CFA FRCS.
- Operations paneling streets and update mapping sent: 16 million CFA FRCS
- Development of public places: 30 million CFA FRCS
- Upgrading and rehabilitation of the royal palaces : 30 million CFA FRCS
- Construction of modern public toilets FrCs 7.5 million CFA
- Clean up and pave 'street 305': 59 million CFA FRCS
- Financing construction of youth centers in Porto-Novo: 20 million CFA FRCS

Comparison with the French city of Bordeaux

Population: 215,000 inhabitants

2010 Budget: 386 million euros (252 billion CFA FrCs)

Tax revenues represent only 51% of operating revenue expected, the rest is provided by the global running (provided by the state), the tariff policy of the City services, investment income ...

Operating expenditure budget: 297.8 million euros (195 billion CFA FrCs) (77% of the budget)

Capital expenditure budget: 62 million euros (40.6 billion CFA FRCS) (16% of the budget)

Mentioned was development of nurseries, schools, public parks, and modernization of public lighting. But no Highways. The remaining is used for debt reduction for the city.

3. Decentralized cooperation

The city benefits from the support of stronger cities on the international stage. This twinning between cities was signed at the end of World War II and was enabled by the French decentralized cooperation.

The council of agglomeration of Cergy Pontoise



The decentralised co-operation, between the two collectivities started in 1995, to accompany the process of decentralization that started in 1990 in Benin.

Structuring strategy of partnership

Accompanying the city of Porto-Novo to elaborate and implement its urban project and its strategies of development and promotion of its territory
Reinforcement capacities of management and implementation of the public policies
Amelioration of the quality of life, seeking mainly participation of the local population and actors.

General objectives

Reinforcement of the local dynamism by mobilization of actors in the implementation of the cooperation projects and by the settling of an organization allowing better dispatching between the local initiatives.
Open the local actors up to the world by the development of exchange of experience, knowledge and savoir-faire.
Contribute to the international shine of territories by the valorization of their competences and their specificities.

Grand Lyon GRANDLYON communauté urbaine

From the beginning of colonial history, the first missionaries that arrived in the city belonged to the Beninese Society of African Missions (SMA) of Lyon. In 1996, a series of exchanges took place between Lyon and Porto Novo which lead to a declaration of intent of partnership being symbolically signed on December 8, 1997.

The first agreement signed in 2000-2002 was part of an installation time of communities and local institutions in Benin. It focused on supporting decentralization, support services and training of staff. The new agreement will go further. It puts particular emphasis on bilateral relations, seeking to encourage more direct involvement of local stakeholders in both communities and engagement in the international scene, ultimately to get actively involved in local sustainable development.

Action programs

- Institutional Support: Enhanced technical communities Benin and Training of elected officials
-Urban Development: Building capacity of City Management

-Agricultural Development
-Management of water and sanitation
-Development of a health cooperation
- Digital Development

2. International institutions

Agence of French Development, AFD



The French Development Agency is a financial institution at the heart of the French public aid for developing countries. Its mission is to help finance this development. The AFD supports public authorities, the private sector and local associate networks for the implementation of economic projects and social issues. Its actions are in favor of economic growth and environmental preservation and are part of the Millennium Development Goals (MDGs). These development priorities have been defined in 2000 by the United Nations to halve world poverty by 2015.

In Benin, the AFD is mainly in charge of interventions in the education, rural development and infrastructure sectors. In 2008, it launched a program to Develop the cotton industry and organic fair trade fair in central and west Africa.

World Bank, WB



The World Bank is a structure of financial support for developing countries, created in 1944. It aims to fight against poverty through the search for durable solutions, and assistance for people to take charge and control their environment.

This organization is divided into two development institutions whose capital is owned by 186 countries.

Some ongoing programs:

Project Management of the marine community and coastal biodiversity

The project focuses on the conservation of biodiversity hotspots located in sites designated as globally significant by several organizations:

- Designated Ramsar sites
- Global 200 priority eco-regions identified by World Wildlife Fund (WWF)
- Priority areas for conservation by the global representative system of marine protected areas International Union for Nature Conservation (IUCN)

2) Second project of decentralized urban management

The additional credit will finance costs associated with scaling up comprises construction and rehabilitation of 9.6 kilometers of roads and 10.8 kilometers of drainage works to further improve access to some of the poorest neighborhoods of the major cities of Benin and reduce periodic flooding in these neighborhoods.

Organisation pour l'alimentation et l'agriculture - FAO



The United Nations for Food and Agriculture was established in 1945 with the aim of improving nutritional status, living standards, agricultural productivity and the plight of rural people in general. The Inter-governmental organization, FAO has 180 Member of State, plus from the European Union.

Benin is a member of the Community of Sahel-Saharan States (CEN-SAD) and is involved in the major regional strategies for food safety and human and animal health.

Under the Special Programme for Food Security (SPFS), the FAO has assisted Benin from July 1999 through to December 2007, on the following components:

- Water control: studies and development (lowlands and flood plains)
- cropping intensity: demonstration for the improvement of major food crops, chosen by the producers
- Diversification: intervention involving small animals (poultry, pork, sheep and fish), vegetables and processing of agricultural products

BAD - The African Development Bank, BAD



BAD is a multi-national development bank established in 1964.

53 countries are members, including 24 European countries, with several North, south American and Asian supporters. Its role is to promote economic development and social progress in African countries.

In Benin, many ongoing projects are financed by BAD

- Draft-tarring of the road Ndala - Nikki Chicandou-Nigeria border - Sector: Transportation
- Support Program for growth strategy and poverty reduction - PASCPR III - Sector: Economic and financial Governance
- Support to the dairy and meat industries (PAFILAV) - Sector: Agriculture and agro-industries

UNESCO - UNESCO



The World Heritage List, or heritage, is established by the World Heritage Committee of the United Nations Educational, Scientific and Cultural Organization. The program's goal is to catalog, name, and conserve sites with known cultural or natural importance to the common heritage of mankind.

Properties World Heritage listed : Royal Palaces of Abomey (1985)

Mandates of Benin on the World Heritage Committee 1995-2001 2003-2007

Indicative list

Although subject to the indicative list inclusion on the Tentative List is the first step of inscription onto the World Heritage List itself. It includes the elements for which the territorial State has filed an application to UNESCO, in session prior to acceptance of the World Heritage Committee.

- Site-lacustrine Ganvié (1996)
- City of Ouidah: former district roads and slavery (1996)
- City of Porto-Novo: old neighborhoods and Royal Palace (1996)
- The W national park and the local habitat in northern Benin (1996)
- the underground Village of Agongointo-Zoungoudo (1998)
- Pendjari-National Park (2009)

In February 2007, the first subregional workshop training in heritage education was held in in Abomey. The workshop introduces teachers and educators informing about the subject "World Heritage in Young Hands" with practical training teaching young participants basic techniques for preventive and curative conservation.

1. Health services

The health sector is characterized by a complementarity mix between public and private care. In the public sector was found the following (2002 data):

- 3 central health centers
- Nine district health centers (nursing, maternity, pharmacy)
- Six nursing school
- A county hospital
- A center of pneumo-phthisiology

Or in summary, two hospital beds and 134 beds for maternity health centers
For a total of 39 doctors, 145 infermiere, 69 midwives

2. Education

Like health services, the education system of Porto Novo is composed of both public and private institutions. In the public sector, there was in 2005:

- 13 kindergartens
- 63 primary schools
- 14 secondary schools (12 colleges, 2 high schools: (Toffa 1st and Béhanzin))

4 technical and professional academic institutions

- The technical high school,
- Gendarmerie's National School
- The armies National superior School
- The regional technical education and training for professionals



The enrollment rate reached over 85% in the city of Porto Novo, but the towns facilities are divided poorly. Thus, the center is much better equipped than the northern districts of the city.

On the academic side there is:

- A campus of the University of Abomey-Calavi
- The Ecole Normale Supérieure
- The Regional Judicial Institute
- The Institute of Mathematics and Physical Sciences
- The National Institute of Youth Sport and Physical Education
- The School of African Heritage
- 2 Central private universities: The University of Science and Technology of Benin, the African Protestant University

3. Transport & highways

3.1 Highways

In Porto Novo, the road network remains essentially consisting of earth roads. In 2009 it was estimated as follows:

- 18.7 km of tarred roads (sometimes in very bad condition)
- 8.7 km of paved roads
- 38.1 km of earth tracks

The earth roads present many traffic problems. Not only does heavy rain cause these routes to shape irregularly making them dangerous, but also during the rainy season, the holes fill with stagnant water, which makes part of the network not so usable throughout the season. We call these earth streets "vons", which means road running north-south, although this is not always the case.

On the occasion of the fiftieth anniversary celebrations of independence and with the support of government, major road works have been launched and should be completed by 1 August 2010:



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The ring road is paved over 2.5 km at the junction with the RNI 1a. It is anticipated that, thereafter, this work is extended to another 2.5 km until the road Adjara (RNI 1).

The entrance of town, opposite the bridge and adjacent to the future national assembly, is currently undergoing important improvements: the installation of a new bitumen surface, closure of the bus station and enhancement of the edges of the lagoon. The sidewalks of the street that passe between the Bayol square and the cathedral are also paved.

This work is accompanied by a large improvement plan for street lighting:

- From Kandevié to Plein air (via Dangbéklounon)
- Along the bridge of Beau-rivage to Catchi
- On the asphalt ring road
- At the edge of town towards Adjara

Other road works are funded under the PGUD such as the paving of Route 60 (see management of rainwater), or by BOAD (penetrating into Médédjionou, bypassing the Songhai Centre)

3.2 Urban transport

The “Zémidjan” (motorcycle taxi) is the most common urban transport method in Porto Novo. Since its appearance in the town, it has completely replaced the internal urban transport by taxi and mini-buses. Although it is very difficult to know the exact number of different vehicles in Porto Novo, it is estimated that there were over 2,500 “zem” in 2005, and they provided almost 40% of motoized urban trips.

The city also has several official and spontaneous stations (Ouando, Dangbéklounon, Adjara-Docodji, the bridge Station...), and four car parks (St. Peter and Paul, Djassin, Agbokou, Déguègan ...) dedicated to inter-urban transportation.

Finally, there are three river piers, this despite a decline in transport on the lagoon.



Flooded Road : Koutongbé (May 2010)



Laying asphalt on the bypass at the Municipal Pool



collecteur G - The construction of a drainage network to Anavié: manifold G



Uncontrolled dump, next to the lagoon, south of the Central Market



Accumulated waste is often burned



Most houses have a well

4. Environmental hygiene

In 2009, the urban cleaning service of the city led, among other actions the removal of unwanted sand from infrastructure (900 000m² of routes, divided on all days of the year with a budget of 36 million CFA Frcs), flushing of collecting water in the gutters and unblocking the outfalls. But in terms of solid waste management the situation in Porto-Novo is certainly the most worrying of all and it requires appropriate infrastructure urgently.

Today the collection of garbage is carried out by a state team with only a dump truck and a van with an annual budget of 15 million CFA francs. The town hall is also taking steps to eradicate inappropriate unofficial dumps, as Foun-Foun, or Agbokou, Ouando, which 50 000 tonnes of refuse was disposed of to landfill waste in 2009, additionally waste is still too often used as fill for construction in the foundations. In terms of management, people are generally content to leave waste abandoned, with uncontrolled dumps which strongly mark the urban landscape. So when the garbage has accumulated, it is not uncommon to see someone set it on fire. The Lokpodji site is not spared, and it is often used as an illegal dumping site.

The city of Porto Novo, has ambitious plans for improvement and reorganization of its waste treatment system. One way it is planned to improve is by the reorganization of the collection area and the awareness of this within the local community. This fits within the second decentralized urban management project (called PGUD 2) and includes the construction of waste assembly points (five have already been made, and seven others are being put in place). But the biggest project of the reorganization of the sector remains the construction of a landfill site in Takon, north of the city. Today, the municipality has led the phased accompaniment of neighboring communities into the infrastructure of the city which includes the wiring of electricity of the village, the renovation and expansion of the school and raising the awareness of local residents. The Project is estimated at just under 2 billion Frcs CFA (paid by the PGUD 2, only the land acquisition being charged to the Town Hall), and it is planned for 2011.

At the same time, the City Council adopts new machinery, compressing of a dump truck and crane ... to achieve 20% of the collection directly managed (against 80% by an operator). It also runs salubrity campaigns in the city and aims to undertake recycling operations and valuations of solid waste.

In 2009, expenditures amounted to clean the city of Porto-Novo, the sum of 263.6 million CFA Frcs.

5. Water management

5.1 Drinking water supply

Porto-Novo was equipped with a system of water supply during the colonial period, a system which has since been strengthened with the assistance of the World Bank and the French Development Agency. It consists of a well field north of town on the road Sakété, a processing plant and a distribution network (425km in 2008). It reaches all areas of the city but also other municipalities such as villages at lake Aguégués.

The plant is now capable of producing 10,428 m³/day with average production in 2009 of 9000 m³/day. This does not prevent many water shortages. In 2008 it was estimated as follows:

Production /Production	2,9 millions m ³
Ventes/Sales	2,3 millions m ³
Rendement /Output	80%
Nombre d'abonnés/Subscribers	16 311

If we take there are an estimated 50,000 homes in need of supply (the number of households in Porto-Novo), and some of the subscribers to the drinking water are businesses, we may assume that less than one quarter of households has access to drinking water.

5.2 Sewage

There is no current sewage network in Porto Novo and in most areas sanitation facilities are also lacking. Where they exist, they are generally limited to simple holes in the ground or dry pit latrines. Only a few modern buildings are equipped with true septic systems. The wastewater is then discharged mainly by direct application into the dirt streets, or into the gutter (when a gutter exists).

5.3 Rainwater Management

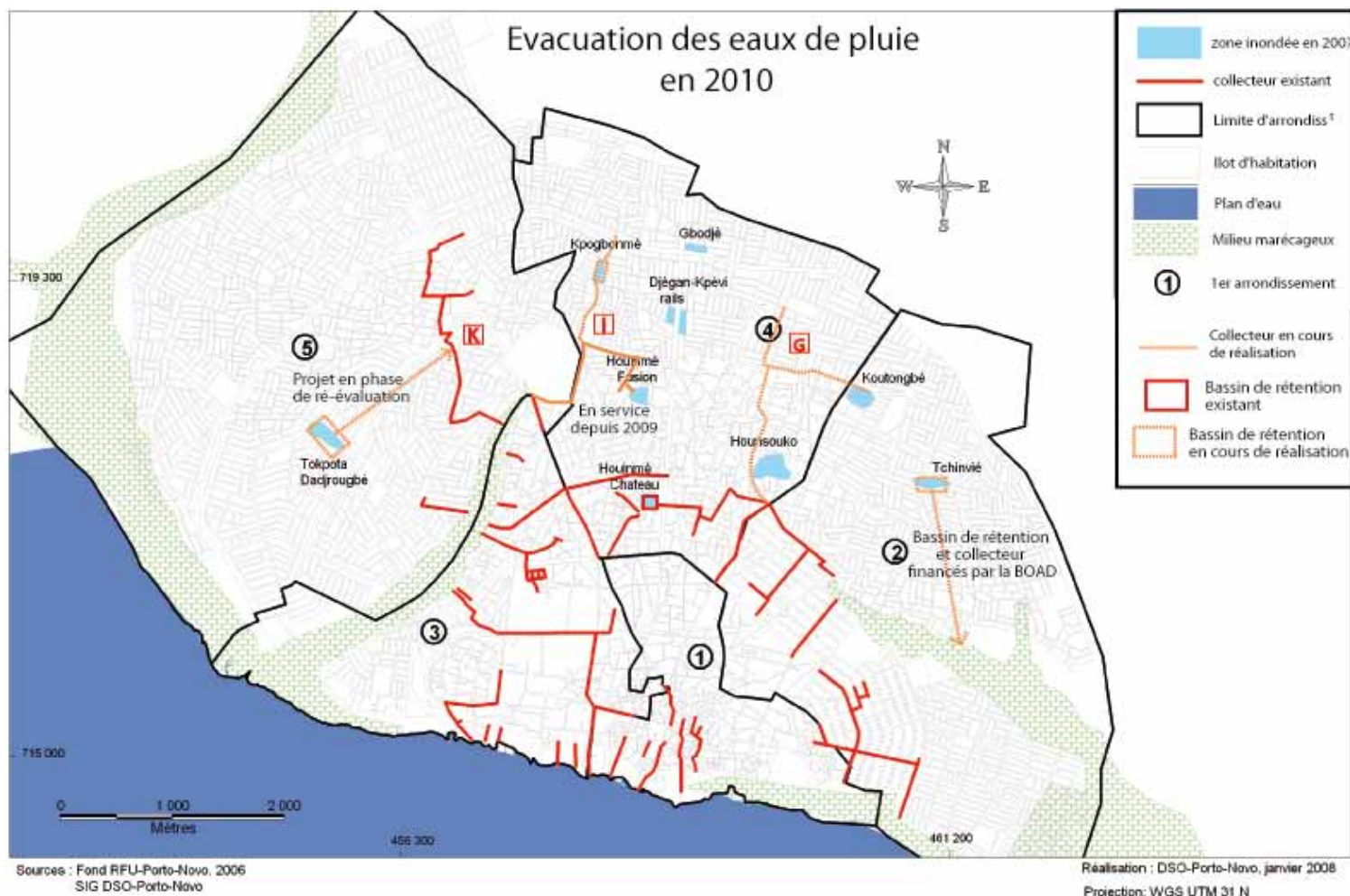
The network of storm drainage has long been very limited and mainly focused on downtown areas. Also, many areas of the city have previously flooded repeatedly during the rainy season. The City Council sought to limit construction in these areas due to the dangers of landslides and flood. But these rules are not currently respected.

For several years, the City Council has launched several major construction projects of new sewers, streams, with multiple financing. Thus phase 2 of the manifold I is funded under the 1st August 2010, and the manifold G, by the PGUD. The second project includes the paving of Highway 60. It is estimated at a cost of around 3 billion CFA FRCS.

Eventually, the city will be equipped with four drainage ponds, and a collector system which will overcome the strongest of flood.


6. Electricity

Porto-Novo is powered through a power line (63kV) from central Akosombo and Cotonou. Despite the installation in 2005 of a new power plant by the SBEE, the capital remains significantly under powered, and power cuts are frequent and can last several hours. They are commonly unpredictable in location and happen unannounced.



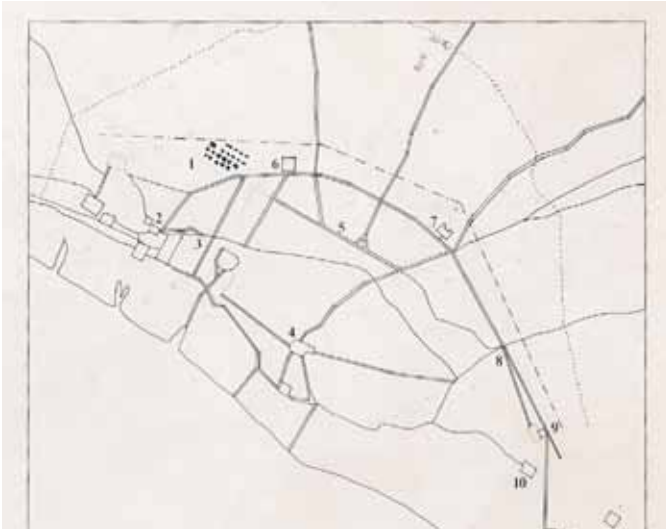
Rain water management in 2010

mise à jour Juin 2010 d'après renseignements DST

An aerial photograph of a site, possibly a construction or archaeological site. A white letter 'D' is marked on the ground in the center-right. A thin white line forms a circle on the left side of the image. The ground is a mix of green grass and brown, possibly disturbed earth or debris. A road or path is visible at the bottom. The image is overlaid with a semi-transparent grey banner at the top containing the text 'PART 3 : the SITE'.

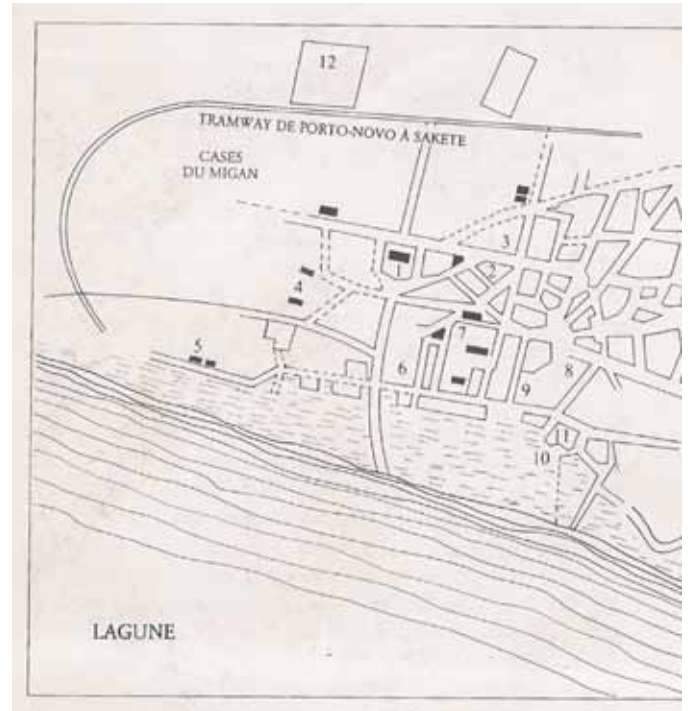
PART 3 : the SITE

1. Development



1895

In the study area a French military camp is present (1) and the military head quarters (2). The location of the headquarters corresponds to that of the house of the French Governor, which presumably was built in the same location subsequently. Today the Colonial building functions as the National Assembly. No bridge is present yet, but the location of the Cathedral Notre Dame de Lourdes is indicated (3).



1920

'Routes of the new roads west of the old city' Central in the zone is the Governor's house (1), which is via road directly connected to the lagoon. Close to the old city an area for governmental publication (2) and a residential area (3) can be found. The area starts to develop into a administrative zone: a hospital (4) is created, which remains in the same location up until today, and Public works (5) and the Post office (6) are installed. No. 7 indicates the Catholic mission. The military zones grows with a new guard camp (12). The houses of the Migan are acknowledged by an indication (see for more information 3.1 urban textures, traditional area and 5. green structures and elements).



1952

On the map is noted that 'the facilities and dwellings of the Europeans remain grouped in the west of the city'. Many of the historic Colonial buildings are indicated. The communities of Quinlinda and Adjina, in the far west, are informally indicated.

2. Vision of the city of Porto-Novo



- ↕ Bridge - entrance to P.N.
- road to Cotonou
- 1 New National Assembly's building
- 2 Place Bayol
- 3 Republic's square
- 4 National Assembly
Former house of the French Governor
- 5 Bontanical garden
- 6 Charles de Gaulle stadium
- 7 Béhanzin High School
- Catchi crossroad
- ... Boulevard exterieur
-  Military facilities

Carte basée sur le travail du
Dr. D. Houenoude

.....
 : Interview with Daniel Hounkpèvi, Directeur of the Technical department of the municipality of Porto-Novo :

At the time this document was printed, the English translation of the interview was unfortunately not yet completed. The text will be included in a later version.

3. Urban textures



1) Traditional



2) Afro-Brazilian



3) Colonial



4) Military



5) Colonial housing

Zoning based on touristic map of Porto-Novo

Size urban tissue samples
1 hectare : 100x100 meter
Scale if printed on A4 = 1:400

1) TRADITIONAL



- Occupation : primarily residential. The building height is typically 1 level, max. 5m
- Streets : the neighborhood is surrounded by major connecting roads, in comparison, the inner structure is of relatively small scale. The roads are predominately unpaved, ranging from narrow alleys with a width of 2m, to larger streets of 4m.
- street life + activities : Highly active street life, with a mixed variety of social activities, preformed by people of all ages; children playing, watched by elderly, people selling or simply hanging out.
- time period : the foundation of the oldest houses date back to the early days of Porto-Novo. However, since it is a high density, lively neighborhood, new additions are made up until today.
- form of planning : The land is allocated by a chief. (See the text on land right and issues in the management chapter)
- green spaces / wall : relatively little green area. An important ritual space is taken by the 'Tree of Justice' which towers over the neighborhood.



An alley with typical housing



Main square with in the back the House of the Migon

2) (HYBRID) AFRO-BRAZILIAN



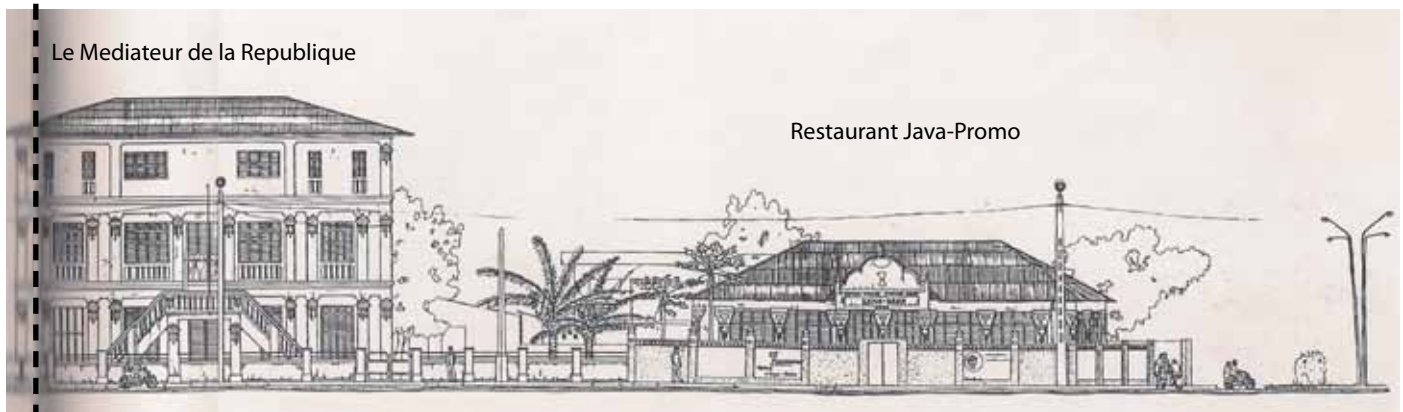
- Occupation : residential mixed with retail located on the ground floor. In this area a special type of 'hybrid' architecture can be found; a transition between the Afro-Brazilian and European style. The first European settlers adopted the architectural style of the Afro-Brazilian houses, because they were at that time regarded as a symbols of wealth and power, while the European architectural style had not yet been implemented as such. The building height is 1-2 levels, with high rooms of 3-4m.
- Streets and street life + activities : Characteristics similar to the traditional neighborhood in the study area. The 'rue Etienne' (rue 110, which also forms the border of the site) is the exception to the rule : a major connecting street, which runs through the urban tissue as a lively vein.
- time period : End of the 19th – start of the 20th century
- form of planning : It is not clear how this area was organized. (DIDIER?)
- green spaces / wall : relatively little green area



Game of jeu de boules in the street. In the back a house acknowledge as important historical object of architectural heritage. Number B177

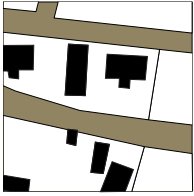


Rue Etienne, close to the Catchi crossroad, in the far north of the site



The eastern edge of the Republic's square, opposite of the National Assembly. (Sinou, A. & Olouéd, B., 1988, Porto-Novo, ville d'Afrique noire, p.162-163)

3) COLONIAL



- Occupation : Originally, the buildings in this area were created for the officials of the Colonial administration. Often, they served a double duty: activity took place on the ground floor, while the owner or official was living above them. This was also the case at the governor's house (today the National Assembly), where the governor had his apartment above his office.

Today, the majority of these buildings has an administrative or educational function. There are headquarters of various authorities, like that of the National Assembly, the Ministry of Education, the main post office, the City Court of Justice, Béhanzin high school etc. The buildings are relatively high, with minimally 2 levels and high rooms of 3-4m.

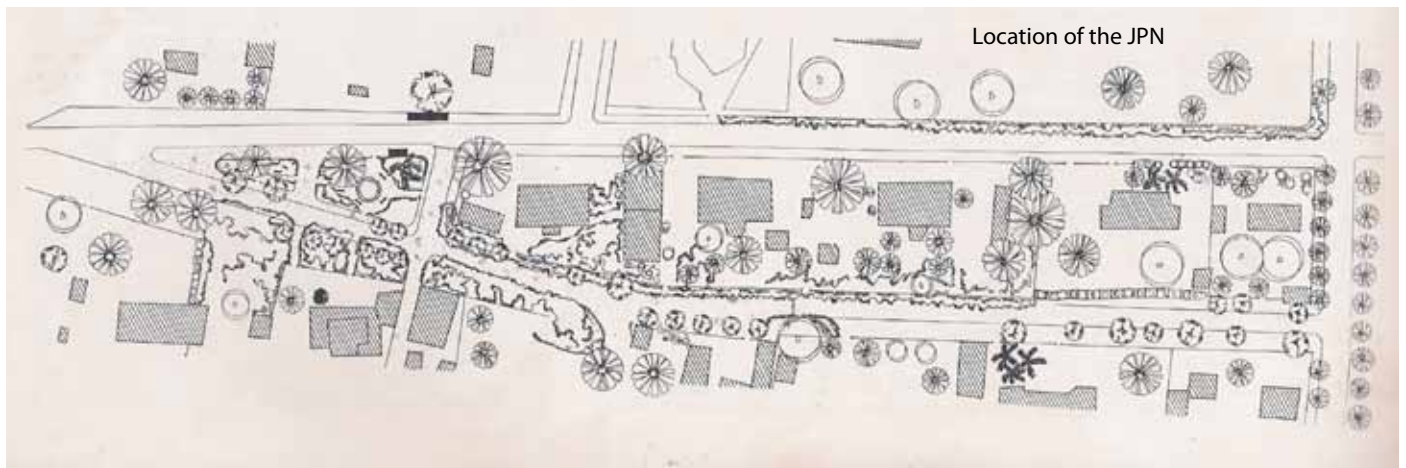
- Street : relatively wide avenues, planned for the use of cars.
- street life + activities : hmm? little?!
- time period : This area dates back to 1890-1900, and has grown until the country's independence in 1960.
- form of planning : formal planning by the Colonial administration according to European standards
- green spaces / wall : According to French standards, the width of the roads permits space for trees, creating shady, lush lanes.
The courtyards of the Colonial style buildings are often planted.



Back garden of a Colonial house, now occupied by the Agricultural ministry.

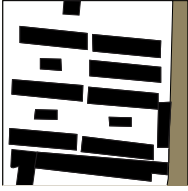


Avenue south of the JPN



Plan of a Colonial type street, south of the Botanical garden.
(Sinou, A. & Oloudé, B., 1988, Porto-Novo, ville d'Afrique noire, p.102)

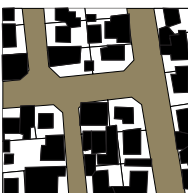
4) MILITARY



- Occupation : military, predominantly police barracks and related services (camps, schools, administrative buildings etc.) The buildings are primarily 1 level. However, because the barracks have a relatively steep roof, the overall height can measure over 5 meters.
- Street width : there are no connecting roads traversing through the plots. Cars are stopped and checked at the entrance.
- street life + activities : in between the barracks activities similar to those in a courtyard can be found, like household activities and social engagement.
- time period : 1940-1960
- form of planning : formal planning by the Colonial administration according to European standards
- green spaces / wall : due to the nature of the occupation, the grounds are surrounded by high walls (+2m), hiding not only the activities beyond, but also the green, lush spaces in which they are set. This creates streets that feel rather stony and narrow because of the visual barrier.



5) COLONIAL HOUSING

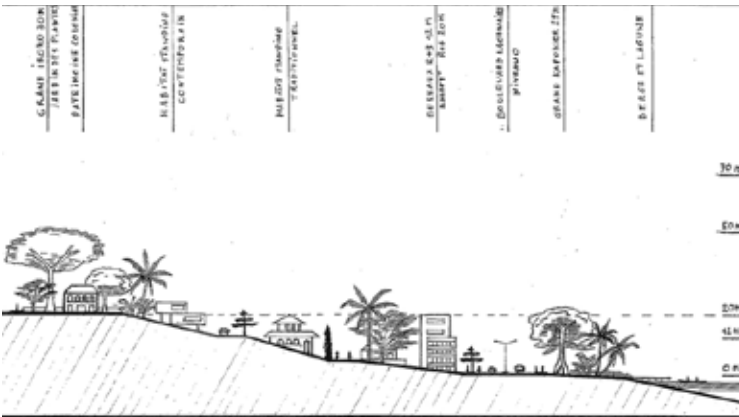
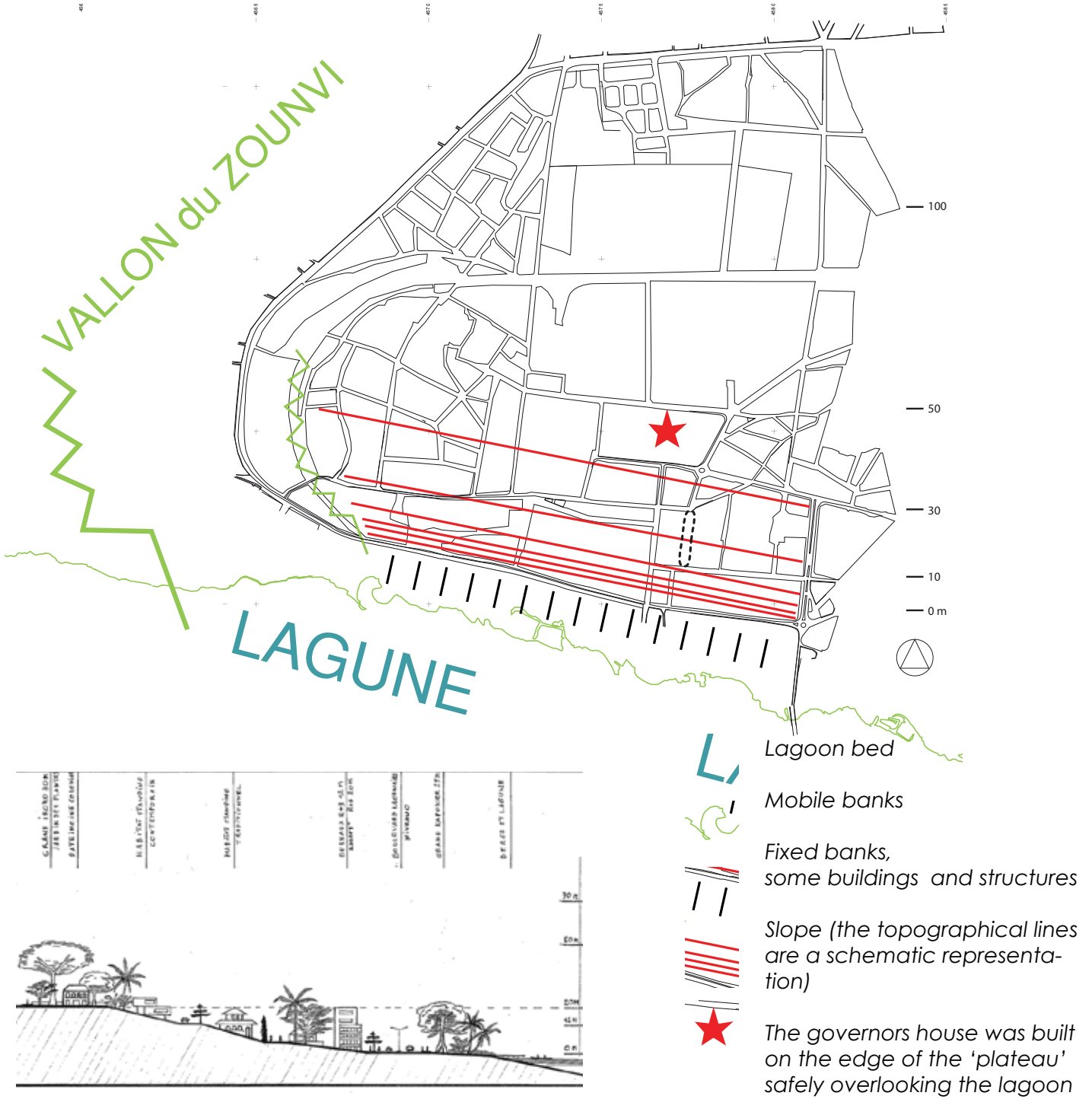


- Occupation : residential, incidental administrative. This small neighborhood of bungalows was originally built for colonial employees. It has characteristics similar to those of some French (middle class) post-war neighborhoods: identical lots and a simple, 1 level lay-out for the houses, which is replicated throughout the area. Over time, and depending on the means available, many additions were made, ranging from simple to extravagant. Some houses have added a level, or the original building was completely replaced by a new structure.
- Street width : wide streets bound for the car
- street life + activities : There are no connecting routes, creating an isolated neighborhood, with little street life.
- time period : 1950s, after World War II
- form of planning : formal planning by the Colonial administration according to European standards
- green spaces / wall : Low walls enclosing the lots to guarantee privacy.



Relatively unchanged house

4. Landscape and relief

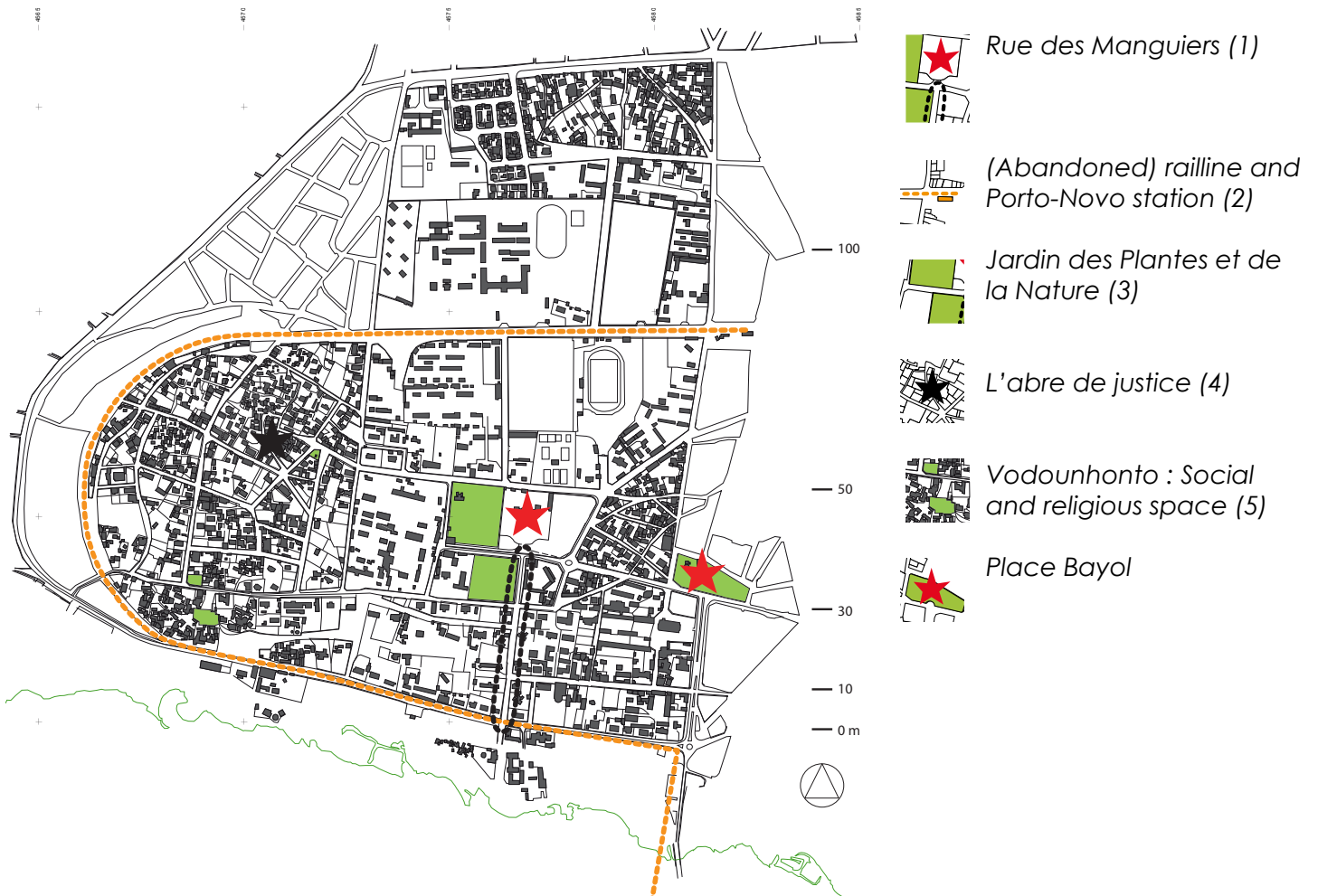


View of the small valley from the bridge in the direction of the lagoon



Slope incorporated in the private domain functioning as a special landscape feature, while maintaining the drainage function

5. Landscape, religion and society : Green structures



The Rue des Manguiers was in the 2009 Ateliers identified as important connection running all the way from the Assemblée Nationale to the Lagune

(Abandoned) railline and Porto-Novo station (4)
 Out of use transport via rails
 build on the old city wall?
 Now: system of green spaces through the city

(1)



(2)



As previously mentioned, the colonial quarter was built over the sacred forest of the king of Porto-Novo, damaging not only its physical appearance but also its spiritual value.

In the voodoo religion, plants are considered to be the children of the sky. They are used in rituals at several levels, codifying the behavioral space: liturgical plants, indicator species of places of worship and plants serving as housing for deities. Each deity, or orisha called Vodou has its own specific plants, ama and altars, which are themselves indicated by plant species characteristics. The main places of voodoo worship are represented by trees, forests, springs and rocks that house the deities. These deities reside most often in trees located in the woods to which they give their sacredness, in isolated fields or in occupied spaces (town or village) where most places of worship are characterized by one or more plant species in the same area either planted or grown spontaneously. These trees and sacred groves are part of the definition of cultural landscapes «associative» as classified by UNESCO.

So, on the site were today the Colonial neighborhood can be found, used to be the old sacred forest of the King of Porto-Novo, which stretched west of the royal city. Sometimes, you can also find it called "Sacred Forest of King Migan". The Mito Migan ("Excellency Migan") is the ministry in charge of religious and judicial affairs of the King Tê Agbanlin (the King who arrived from Abomey and founded the Kingdom of Porto-Novo). Migan officiated at the foot of large ancient trees (iroko, kola, kapok). His descendants continues to get the charge and the title after him. So, the name of "King of the Migan", sometimes used, is not historically correct.

Only two traces clearly remain from this former forest.

- The tree of Justice, in the Migan neighborhood, in the western part of the study area. This neighborhood is structured by the socio-familial structure of the Migans, which still is visible, by the Migan Palace and by the Tree of Justice. According to one of the oral narratives, court was held under the tree, with executions of prisoners at its foot.

- The second is a place now known as the Botanical Garden (Jardin des Plantes et de la Nature, JPN) It was incorporated into the Colonial administration as such in the late 19th century. Today, guided tours of the park are offered on the North side, and the part south of the road hosts a bar-restaurant in a lush and enjoyable setting. In addition, occasionally cultural activities and performances take place (eg, vacation Summer 2011 will be marked by cycles of learning and visual arts).

In the south west of the site a cluster of Social and religious spaces (5) can be found . The traditional names, in Goun, of these Vodounhonto are as follows : Djihoué Comè, Azalou Comè, Agonsa Honto et Dikouin Honto. For extra information on these place, we would like to refer to the conference presented by G. Bassalé : « Enjeux des places vodoun dans l'évolution de la ville de Porto-Novo ».



(4)

(3)



(5)

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