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Urban Forest BNP in Abidjan

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Abstract: ***The issue of conservation of the Ivorian forest and its resources has been at the centre of the concerns of the public authorities since the 1960s. Thus, Côte d'Ivoire (Ivory Coast) has set up a network of protected areas in general and several national parks in particular, to conserve its forest areas and their biodiversity. Located in Abidjan, the Banco National Park (BNP) and its periphery have undergone profound environmental changes in recent decades. These changes, mainly linked to human activities and the rapid urbanization of the Abidjan district, are causing the degradation of the BNP forest. Present paper aims to describe and analyse the various threats linked to urban pressure, in particular the risks of deforestation and pollution, which expose certain areas of the BNP. To achieve these objectives, the analysis of the evolution of vegetation, types of land use, territorial re-compositions and the games of the different actors are used to understand the environmental dynamics of the BNP forest and its periphery. The inventory and mapping of types of risk as well as their impacts on BNP make it possible to identify the area's most vulnerable to human pressures and urbanization. The study is based on an aerial photograph of 1955 and a Spot satellite image taken in 1998 and recent image (2020) on google earth. The aerial photograph was acquired from the Centre for Cartography and Remote Sensing (CCT-Abidjan) and the National Geographic Institute (IGN- Paris). The satellite image was obtained using Spot Image's ISIS program. These data made it possible to map land cover in 1955, 1998 and 2020 and to compare the changing patterns of vegetation through a spatial analysis.***

Keywords: BNP, Deforestation, Developing Countries, Francophone, Sub Saharan Africa, Western Africa.

I. INTRODUCTION

In Côte d'Ivoire (Ivory Coast), since independence in 1960, the issue of conservation of the forest heritage has been a central concern of the public authorities. In order to better conserve its green cover, the Ivorian State has encouraged the creation of a dense network of protected areas which covers nearly 10% of its territory (Lauginie et al, 1995a and b; PCGAP, 1998 and 2002; N'guessan et al., 2005; Dibi, 2007; Dibi et al., 2008). Created in 1953, the Banco National Park (BNP), is located north-west of Abidjan, a modern metropolis populated by more than 5.3 million inhabitants (20% of the total Ivorian population) in 2006. Covering an area of 3474 ha, the BNP constitutes one of the last relics of dense humid evergreen forest in the Ivorian coastal zone. Faced with agricultural pressure and rapid urbanization in the Abidjan region, 86% of the area of this coastal forest has been destroyed since the 1950s (Aké-Assi, 1984 and 2001; Chatelain, 1996; DPN, 2001 and 2002; Duschesne, 2002).

The Banco park is suffering the harmful effects of rapid spatial expansion linked to the demographic explosion and to industrial and commercial activities in the district of Abidjan, a metropolis made up of 10 municipalities and 3 sub-prefectures. Bordered by four municipalities (Abobo, Adjamé, Attécoubé and Yopougon), the BNP suffers the consequences of pollution linked to human activities and urban land saturation, especially since it is bordered to the north, east and south of many precarious neighbourhoods with inadequate sanitation facilities (Béligné, 1994; Hauhouot, 2002). It serves as an outlet for solid and liquid household waste and municipal rainwater is also partially discharged into the park.

Multiple industrial units, informal activities and new residential neighbourhoods border the park, which has already been dealing with various public developments for decades (creation of highways, expressways, infrastructure and equipment necessary for the satisfaction of the urban demand for water, electricity, etc.).

Abidjan's successive development plans have always taken into account the articulation of this forest ecosystem in the urban landscape (Akindès, 1997; BNETD, 1998; Hauhouot, 2002). The enhancement of the park in particular through ecotourism, the development of alternative activities for the attention of poachers and illegal operators and the association of neighbouring populations in the sustainable management of the BNP are among the several strategies implemented to save this ecosystem. However, the BNP is perceived by real estate developers and certain categories of landowners as an "obstacle to the expansion of the city" and a pocket of insecurity in the agglomeration. The differences in perception between the different actors' place this protected area at the centre of logic, actions and various interests between public authorities, real estate companies, landowners, environmentalists and local populations (UNEP, 2015).

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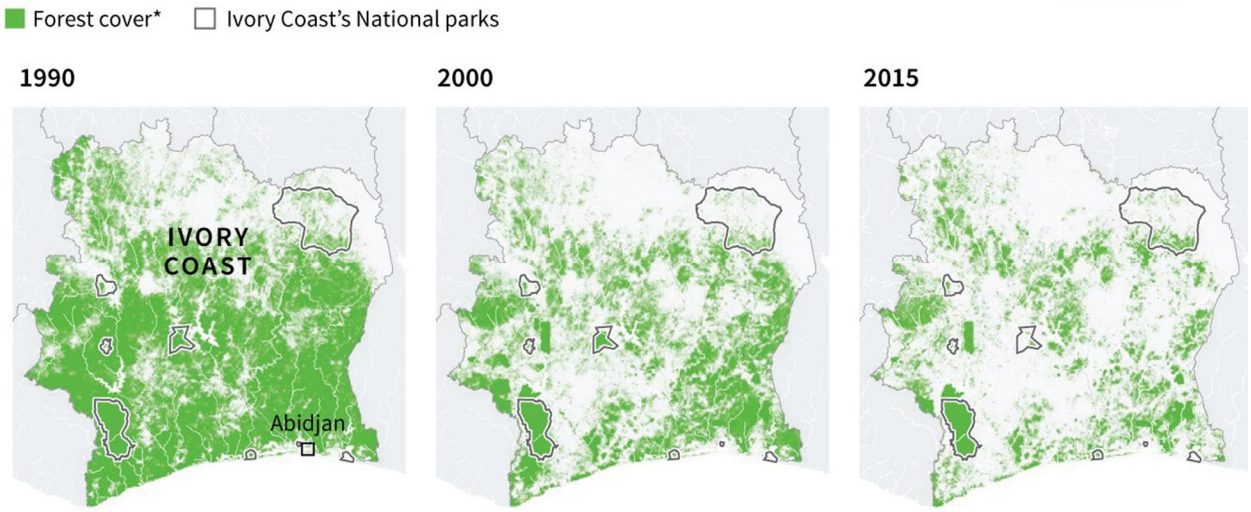
II. EVOLUTION OF FOREST IN IVORY COAST

Ivory Coast now has only two million hectares of forests, almost 90% less than in the early 1960s. “Currently, 80% of Côte d'Ivoire's forests have disappeared in half a century. From more than 16.5 million hectares at independence in 1960, Ivorian forest cover has gradually increased to around 12 million ha in 1970 then to four million in 2000 ", indicated the Director of Cabinet of the Ministry in charge of the Environment, Brahima Fofana during a meeting of experts on the preparation of the Project sustainability and approaches development for transformational management, restoration, conservation of forests and biodiversity in Côte d'Ivoire. As we can see it under the forest area in Ivory Coast is decreasing fastly as well as others third world countries (MECV, 2017).

Figure 1: Evolution of forest in Ivory Coast



Source: IUCN-PACO, 2015

In order to curb deforestation and forest degradation, a loan and grant agreement for an amount of FCFA 7.5 billion (€ 11.4 million) was signed between the Ivorian Minister of the Economy and finance, Adama Koné, and the director of operations of the World Bank for Côte d'Ivoire, Pierre Laporte, in favor of the Forest Investment Program (FIP). The 5-year project will support the sustainable management of classified forests and the monitoring capacities of Taï National Park by involving the communities that depend on it and by proposing incentive mechanisms that will generate other forms of income, which will reduce the human impact on protected areas, according to the World Bank. Côte d'Ivoire is one of the poor performers in terms of forest conservation. The country unfortunately has one of the fastest rates of deforestation in the world. A situation both worrying and appalling which disturbs the serenity of decision-makers. Hence the absolute search for solutions to reverse the trend (World Bank, 2011).

From 16 million hectares of forest in the 1960s, Côte d'Ivoire now has less than 2.5 million hectares, or only 11% (figure 1). The 7th Report of the World Bank on the economic situation in Côte d'Ivoire had already revealed it in 2018, before the director general of the Société de Développement des Forêts (SODEFOR) came to confirm the facts on Thursday, January 17, 2019 in the prime minister's auditorium in Abidjan-Plateau, on the occasion of the presentation of the new forest surveillance tool which is none other than the Starling. "The deforestation observed in Côte d'Ivoire is one of the highest in the world," said Colonel Mamadou Sangaré. Faced with this sad observation, the CEO of SODEFOR emphasizes that the objective of its very short-term structure is to be able to extend this new forest monitoring strategy to all classified forests. “The language now needs to change to say that in 2019 we were at 11% forest cover and that in 2020, we are maybe 15; 20; 25 or 30%”, he wished. If Starling appears to be the panacea for slowing the rate of deforestation in Côte d'Ivoire, it nevertheless deserves to be popularized (MECV), 2008.

The first factor according to the report is agriculture, which contributes 62%. This is followed by logging (18%) and the extension of infrastructure (10%). The mostly illiterate farmers put all their hopes on agriculture. For them, there is no question of changing activity. If the Starling comes at the right time for better forest surveillance, reform in the agricultural sector is needed. It would be desirable to practice agroforestry or zero deforestation agriculture precisely recommended by REDD +. We believe that it is this combination that will allow the Ivory Coast to reach its objectives of reaching 20%, or six million hectares of forest restored by 2040 (Georges KOUASSI, 2019).

III. EVOLUTION OF LAND USE IN THE BNP FROM 1955 TO 1998:

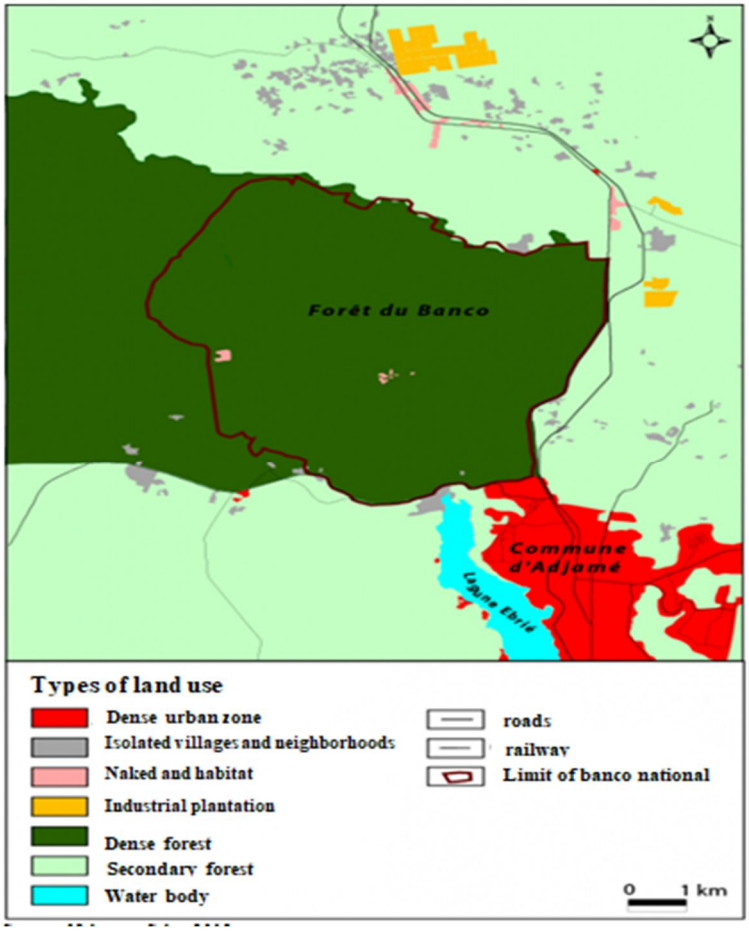
Gérard Beltrando, (2013), the environment of the BNP has undergone rapid changes since the 1970s under the effect of the rapid urbanization of the district of Abidjan, and of demographic, economic and industrial growth. Land use in 1955 in the BNP and its periphery shows that the landscape is dominated by forest despite the presence of disparate urban tasks (figure 2). In fact, during this period, the dense forest covers an estimated area of 5,462 ha (33.44%) while the secondary forest occupies an area of 9,220 ha (56.4%) on the land use map produced at based on the aerial photograph of 1955. These two forest formations represent nearly 90% of the landscape of the study area (Table 1).

Table 1. Land use of Banco National Park (BNP) and its periphery, 1955*

Themes	Area (hectare)	Percent (%)
Industrial plantation	144	0.88
Bare soils and habitat	46	0.28
Isolated villages and neighbourhoods	264	1.61
Dense urban area	950	5.81
Dense forest	5462	33.41
Secondary forest	9220	56.40
Body of water (lagoon)	262	1.60
Total	16348	100

Source: Gérard Beltrando, 2013. *Note: Area obtained from aerial photograph of 1955

The BNP is almost covered with dense forest; the only visible traces of enthronization are those of the forestry school and agricultural camps in the centre and south-west of the park. The main urban centre adjacent to the BNP is located to the south-east in the municipality of Adjamé (Figure 2). Nevertheless, a few villages and new neighbourhoods are emerging in the north and south-west of the park (Nakouma Sako, 2013).



Source: Nakouma Sako, 2013

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Indeed, according to Hauhouot (2002), in the 1950s, Abidjan was a medium-sized city, sparsely populated (55,000 inhabitants) with many villages located on its periphery. The spatial information obtained by processing aerial photography clearly shows that the main urban area in 1955 was located only in the municipality of Adjamé. In 1960, upon the independence of the Ivory Coast, Abidjan was its political capital and experienced significant changes in its population and its infrastructure. From 500,000 inhabitants in 1970, Abidjan had nearly 5,000,000 inhabitants in 2006 (CEI, 2006). This rapid urban growth has caused the destruction of forest ecosystems which have been replaced by dwellings. The map made from the interpretation of the 1955 aerial photograph shows that the eastern part of the BNP administrative boundary is covered with secondary forest, plantations and fallow land. These spaces around the BNP were destroyed by the construction of infrastructure and urban equipment related to the development and extension of the city of Abidjan. These developments have caused the isolation of the BNP forest in the Abidjan metropolis.

Gérard Beltrand, (2013), In 1998, the BNP and its periphery were covered with 2826 ha of dense humid forest with closed canopy, 434 ha of forest plantations and 624 ha of secondary forest (Table 2). All of these types of forest vegetation, with a significant woody stratum, an average secondary stratum and more or less dense undergrowth, represents a total of 68% of the study area. If at first glance, the BNP, within its administrative limits, is almost covered with forest, the urban areas around its periphery represent 32% of the area. The extension of the Abidjan metropolis consumes peripheral forest areas, as is the case with the BNP on the western front of the Abidjan agglomeration.

Table 2. Land use of Banco National Park (BNP) and its periphery, 1998*

Themes	Area (hectare)	Percent (%)
Dense humid forest	2826	49
Forest plantations	437	8
Secondary forest	624	11
Urban area	1821	32
Total	5705	100

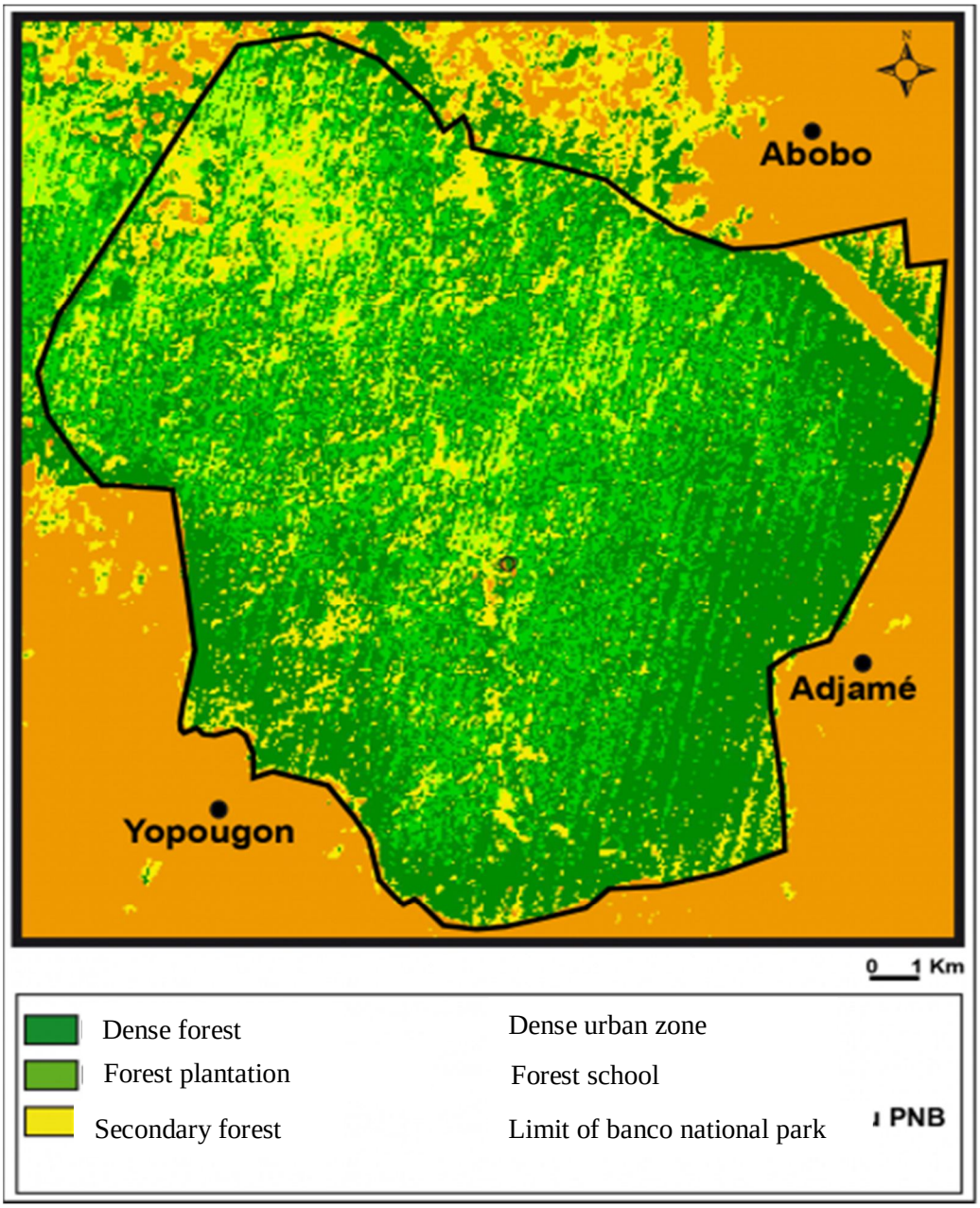
Source: Gérard Beltrand, 2013. *Note: Area obtained from the satellite image of 1998.

The map is based on the assembly of aerial photographs from 1955/56 covering the region of Abidjan. Source aerial photographs acquired from the Centre for Cartography and Remote Sensing (CCT-Abidjan) and the National Geographic Institute (IGN-Paris). In 1998, approximately ¾ of the forest was surrounded by the built-up areas of the agglomeration, particularly in the south, west, east and north of the GNP (Figure 3). This extension of densely populated and insufficiently developed urban spaces is the cause of forest degradation. To the north-east of the GNP, bare soil occupied by electricity pylons isolate part of the forest.

IV. BNP, A FOREST GRADUALLY ENCIRCLED BY SETTLEMENTS

The illegal exploitation of forest resources is linked to the types of locality (villages, residential and precarious neighbourhoods, etc.) on the periphery of the BNP. The nature and intensity of the pollution vary in relation to the types of locality and the dominant activities of the riparian population. The park is bordered to the north and to the south by former villages of the "Ebrié and Attié" ethnic groups located, following the various spatial extensions, in the urban area of the district of Abidjan (Akindes, 1997). These villages are mainly inhabited by natives who claim a large part of the territory of the BNP. These land claims therefore influence the relationships of these populations with the park, which they consider to be their traditional territory, of which they have been used for centuries. Indeed, agricultural activities and speculative land practices are still dominant among this category of the population. The situation of their villages in the district of Abidjan with a large population and numerous urban economic activities leads to few changes in the agricultural practices and the relationship with the land of these villagers. In contrast to these villages, the park is also bordered by residential districts, mostly inhabited by merchants who run small businesses in the various communes of Abidjan (Dibi, 2005). The populations of these neighbourhoods practice service activities and show little interest in the park's resources. The risk of direct exploitation of the forest by this category of the population is therefore lower compared to the populations of the villages. In these two types of localities neighbourhoods are mostly middle class, including workers in the public or private sector who have bought houses near the park through real estate transactions. The areas with the most land claims are to the northeast and south of the park (figure 3). These contested areas are located near the riverside villages of Anonkoua Kouté and Sagbé to the north, Agban-attié and Agban-village to the south-east, and Andokoi to the south-west. These areas are intensely exploited by the villagers, in particular to collect fuelwood, traditional and culinary plants (Thiombiano, 2011).

Figure 2. Vegetation map of Banco National Park (BNP), 1998



Source: Gérard Beltrando 2013

Note: Extracted from the supervised classification of the satellite imagery of January 1998

Land pressures in the northeast of the park are the most intense. The natives openly claim the portion of the forest that was isolated following the passage of high voltage power lines inside the park. This portion of the park, separated from the rest of the forest, has even been the subject of numerous attempts at subdivision by the villagers. These attempts have often resulted in violent clashes between forest police forces and villagers. The residents in this part of the park are hostile to it. For them, the presence of this forest is synonymous with insecurity. Indeed, these populations believe that the forest is a refuge for criminals and satanic spirits (KOFFI, 2004).

The types of administrative boundaries also play an important role in the behaviour of the populations living in the Banco forest. Forest areas located near the administrative limits materialized by a wall, a barrier or a sign are less “attacked” than those in direct contact with the populations. The permeability of administrative boundaries also varies according to border areas and the practices of local populations (Dago, 2015).

The cartographic analyses based on socio-economic and environmental variables noted around the BNP show that the most vulnerable areas on its margins are located, initially in the southwest, east and south half. northeast which are part of the areas where the administrative limits of the forest are not materialized despite a high urban density. The infiltrations found in the forests adjacent to these areas are more significant. Secondly, in the extreme south of the park, the administrative limits materialized by the highway where the forests are less affected by illegal infiltration. The presence of this heavily trafficked roadway partially shields this part of the park from illegal infiltrations found on the edges of the forest. Finally, the areas located to the north-west of the BNP, at the edge of the Anguédédou protected area, are weakly affected by harmful human activities. The natural protection of the BNP by the neighbouring Anguédédou forest and the low population density in this area results in low exploitation of forest resources located near this boundary (Tia, 2015).

V. BANCO NATIONAL PARK: A FOREST THREATENED BY POLLUTION

The park's isolation in the urban area of Abidjan is the main cause of the pollution observed. The types of solid or liquid pollution listed lead to forest degradation. In fact, on the edges of the park, several types of human activities cause environmental pollution. In Abobo, to the north and north-east of the park, the various economic activities linked to the sale and repair of automobiles, in particular the “Abidjan Automobile Casse”, lead to the rejection of a large quantity of abandoned spare parts in the park forest. In addition, engine oils are discharged into polluted water drainage channels which then flow to the park. These same threats are also visible in the east and south-west at the edge of the park in the communes of Attécoubé, Adjamé and Yopougon (Koffi Lazare, 2013). Many sources of pollution come from household waste. Local residents discharge household waste and water from septic tanks directly into the park. This is the case in Adjamé, Andokoi and Abobo where discharges of this type are significant. Next, the Abidjan House of Arrest and Correction (MACA), the largest prison in Côte d'Ivoire with more than 5,000 inmates in 2000, is located at the southwestern edge of the park. Waste from its septic tanks is also discharged into the park. All this waste is the second source of pollution in the Banco forest. The park is also bordered by several Small and Medium Industrial Enterprises and by small artisanal production units of traditional soaps made by chemical fermentation. These units are located to the north-east in the commune of Adjamé and to the south-west in Yopougon. The liquid waste produced by these units is directly discharged into the park. The quantity of waste rejected makes it a major source of pollution in the Banco forest massif (Poilecot, 1995).

The different types of pollution caused by domestic, artisanal or industrial discharges destroy trees and pollute the land over an average distance of 200 m around the sources of pollution. This average distance is estimated from observations in the field and interviews carried out with stakeholders. Polluted surfaces are marked by wet soils with a lot of leftover debris (plastic or glass bottles, nylon bags, used oil, etc.) or household garbage. The impacts of the polluting artisanal activities of car scrapping, car workshops near the forest and industrial sites are also linked to the hydrographic network and the direction of the diffusion of these pollutants in the park according to the topography (Sani, 2014). The solid and liquid wastes produced upstream of this hydrographic network are slowly drained into the park. It is not uncommon to also see wrecks, worn tires, plastics, kitchen utensils and heavy soil erosion along this network. Windfall also numerous and plastic waste invades in places the shallows and the points of confluence of the streams with the main river. In addition, anarchic constructions and household refuse are increasing on the periphery of the BNP.

VI. DISAPPEARANCE OF FOREST NEAR THE MARGINS

Mbayngone and Thiombiano, (2011), The records of logging of trees by local populations for their domestic needs show a high concentration of these illicit activities on the BNP margins in addition to the impacts of urban pollution. The various types of pollution identified and the spatial distribution of human activities in the BNP have made it possible to identify the areas most vulnerable to logging. Figure 3 shows that the most vulnerable areas of the BNP are located in the north-east and south-east. These forest areas, which are located near the border of the BNP with the riparian districts, present degraded landscapes with bare soils, old fallows and cleared areas. To the northeast, the highly threatened area is located at the confluence of a densely populated area, with many forest tracks, recurring land issues, a porous boundary and villages mostly populated by indigenous people who regularly visit the park. To the south-east, in the Andokoi district, a densely populated area, the forest is one of the most threatened in the park. This area of the park is subject to intensive illegal logging, land tenure problems and infiltration of populations to harvest various forest products. The southeast of the park is moderately exposed to deforestation on its margins. This part of the park is separated from the outlying districts by a motorway where automobile traffic constitutes an artificial barrier to illegal infiltration by residents. The least vulnerable areas are in the north-west, near a protected area adjacent to the park (Anguédedou forest). This north-western border of the park is sparsely inhabited and little urbanized.

Tia et al (2015), Due to its location in the middle of an urban agglomeration, the Banco PN is the object of frequent intrusions by neighbouring populations. The causes of its degradation, common to protected areas, are sufficiently documented. In July 2009, the PN Banco was the target of a particular attack on the orders of a local elected official. Information and intelligence patrols carried out by agents of the mobile brigade of the Banco sector, OIPR and those of the Forest Police and Litigation, made it possible to identify deforestation sites in the northeast of the park, in the Sagbé Triangle (table 3). The limits of the Banco NP were definitively fixed in 1998. Any intrusion beyond this limit is a violation of law n ° 2002-102 of February 11, 2002. Overall, this requirement was respected until 2008, during the crisis military-political in Côte d'Ivoire. From this date, deforestation operated without restraint with a cruising speed reached in 2009-2010: the deforestation fell from 13.97 ha (in 2009) to 33.57 ha (in 2010) in the Triangle de Sagbé (52 ha), with a doubling of the size of informal activities under the influence of high voltage lines, going from 10.62 ha to 21.25 ha for the same period.

Table 3: Evolution of Banco National Park (BNP) from 1955 to 2010

Years	Area (hectare)	Percent %	Cut area (hectare)
1955	3474	100	0.0
1998	3474	100	0.0
2008	3422.64	98.22	51.36
2010	3395.48	90.61	27.16

Source: Lazare Tia, 2017.

As we can see, the cut off space was almost zero until 1998. From that date anarchic installations multiplied and caused some clearing of the park. The observation we make from this table above is that from 1998 until 2008, that is to say for a whole decade, the BNP lost only 51 hectares of forest. While this is deplorable the glaring and disturbing finding is that from 2008 to 2010, we see a loss of 27 hectares in just two years (figure 4). In 1953 when BNP was created all around the parc was a forest. But the when time going on due to the evolution of the Economic capital now days, we can easily see that all the forest that was has been cut. As we can see on the picture under. On that picture we can see all the dense forest around the BNP in 1998 estimated at 5705 hectares by Nakouna Sako in (2014), has almost totally disappear.

Figure 3: Land use of BNP and its periphery, 2020

Source: Google Earth 2020

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VII. STRATEGY FOR SUSTAINABLE CONSERVATION OF BNP RESOURCES:

Ministry of the Environment (2010), To curb the exploitation of wood and non-wood resources as well as poaching, co-management (community and mutual management system of the GNP) has been implemented since 2002 by the administrators of the park by integrating the populations into the protection policy of the forest with a view to sustainable development. The co-management policy is a participatory management system that allows neighbouring populations to participate voluntarily in the protection of the Banco forest area and to benefit in return from the financial losses generated by tourist exploitation and direct and indirect jobs linked to development activities. Tourist reception points, guide points and neighbourhoods' hostels are set up and managed by a local workforce recruited from women and young people. The field survey that we carried out made it possible to obtain the point of view of the local populations on its implementation. Analysis of the results shows that the opinions focus on the issues of planning, jobs, tourism development, improvement of the current management policy and strengthening of security around the park. These five concerns could constitute the pillars of the implementation of a real policy of sustainable participatory management in the GNP. It would then imply a constructive partnership between the different actors (managers, NGOs, populations, private sectors, etc.) for harmonious environmental management. The real estate developers who are hostile to the presence of the BNP in the district of Abidjan, revive the historic land claims of the indigenous populations of Ebrié and Attié in order to help them to reclaim part of the forest of which they feel they have been dispossessed. The hostility of this segment of the population is exacerbated by the surge in the price of land in the district of Abidjan. Land has become an essential financial stake for their owners. The price of a hectare of land is around several thousand dollars (US). This income is essential for these families who therefore lead with certain notaries, administrative canvassing in order to obtain the downgrading of part of the BNP which, according to them, corresponds to "old plantations" of their ancestors. The presence of the BNP is therefore considered by some of the Ebrié and Attié natives as a brake on their ambitions of territorial conquest.

Nakouna S. and Gerard B. (2014), The evaluation of the perception of these new management strategies by the populations was one of the objectives of our field surveys carried out during the summer of 2008. The point of view of the populations on the implementation of the participatory management policy wanted by the park administrators was therefore collected. The surveys carried out concern the administrators of the park, the heads of households, the managers of the districts chosen in Anonkoua-Kouté, Andokoi, Abobo-Sagbé, Agban-Village, Agban-Attié, Sodeci. These densely populated neighbourhoods have between 7,000 and 90,000 inhabitants. The analysis of their perception shows that 67% of those questioned believe that the improvement of the current GNP management policy and its development constitute adequate means for its conservation.

Koffi L. et al (2014), in fact, in order to protect it more and to make it participate in the economic development of the populations, its administrators have implemented a participatory management policy. This strategy makes it possible to involve local populations in its conservation. The association of these in this community management of forest resources makes it possible to empower them by involving them in monitoring, development and development missions. The enhancement of the park in particular through ecotourism, the development of alternative activities for the attention of poachers and illegal operators are also part of the many strategies put in place to save this threatened ecosystem. Ecotourism has thus become the spearhead of the participatory management policy of public administrators of the GNP. Béligne, (1994), the land tenure problems resulting from the erection of the Banco forest into a national park are therefore taken into account by managers to win the support of those who are resistant to the classification of the forest. According to the managers we interviewed, in 1973, landowners dispossessed of their land or their beneficiaries were compensated. But the villagers say they have been robbed and challenge the state to provide legal evidence for such compensation. For the indigenous populations whom we interviewed during the focus groups in the neighbouring villages, "the land ownership of an ancestor is immutable even if the State considers it to be his private domain". Land is perceived by these populations as an inalienable good, a heritage transmitted by the gods and ancestors, the right to use of which is never lost.

In order to involve these populations in public policies for the protection of protected areas, the managers of the BNP have initiated a partnership in order to place this protected area at the centre of economic activities generating income for the populations. The land being a source of income for these villagers and given the strong land speculation, the managers of the GNP quickly understood that the sustainable use of this space through a rational economic development, in particular through ecotourism can help to modify the current social representations of indigenous populations around this area protected and make them adhere to the objectives of conservation. In the PNB, the implementation of this strategy requires a partnership between the various actors (managers, NGOs, populations, private sectors, etc.) for concerted management. It is in this sense that several associations are working in collaboration with the managers of the BNP: SOS Forêt, Côte d'Ivoire Ecology, Green Cross of Côte d'Ivoire, Côte d'Ivoire Nature, WWF, Conservation International, Rotary Club, etc. These associations are working to implement a sustainable conservation policy integrating local populations in the management of the park (MECV, 2008)

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VIII. CONCLUSION

The ecosystem of the Banco National Park (BNP) has undergone profound changes in recent decades. In the years 1955, land use in the park and its periphery showed that the landscape was dominated by forest despite the presence of some urban stains. The dense forest delineated on the maps covered an area of 5462 ha while the secondary forest occupied an area of 9220 ha. Three decades later in 1998, 3,450 ha of forest and 434 ha of forest plantations constitute the vegetation of the BNP. This regressive dynamic is due to the horizontal spatial extension of Abidjan which consumes peri-urban forest areas, especially on its western front where the BNP is located. This rapid expansion of urban space poses environmental problems, particularly pollution, the intensity of which varies in relation to the types of locality and the dominant activities of the local population. In fact, the park is bordered to the north and south by ancient villages of the "Ebrié and Attié" ethnic groups with many sources of pollution that come from domestic waste and economic activities. Local residents discharge household waste and water from septic tanks directly into the park. This is the case in Adjamé, Andokoi and Abobo where discharges of this type are significant. In addition, many areas of the BNP are subject to land claims, notably the northeast and south of the park. These contested areas are correlated with the types of riparian localities, in particular the villages of Anonkoua Kouté and Sagbé in the north, Agban-attié and Agban-village in the south-east, and Andokoi in the south-west. These areas are also exploited by the villagers, in particular to collect firewood, traditional and culinary plants. Land pressures are most intense in the north-east of the park where the locals openly claim a piece of land that is an integral part of the BNP and isolated by the passage of high voltage power lines inside the park. According to its managers, the future of the GNP depends on the participation of all in its protection. Even if the recent socio-political situation has slowed down this new dynamic, the action of public authorities and international NGOs which show a growing interest in the protection of Ivorian national parks is an essential marker for the protection of areas. protected in Ivory Coast.

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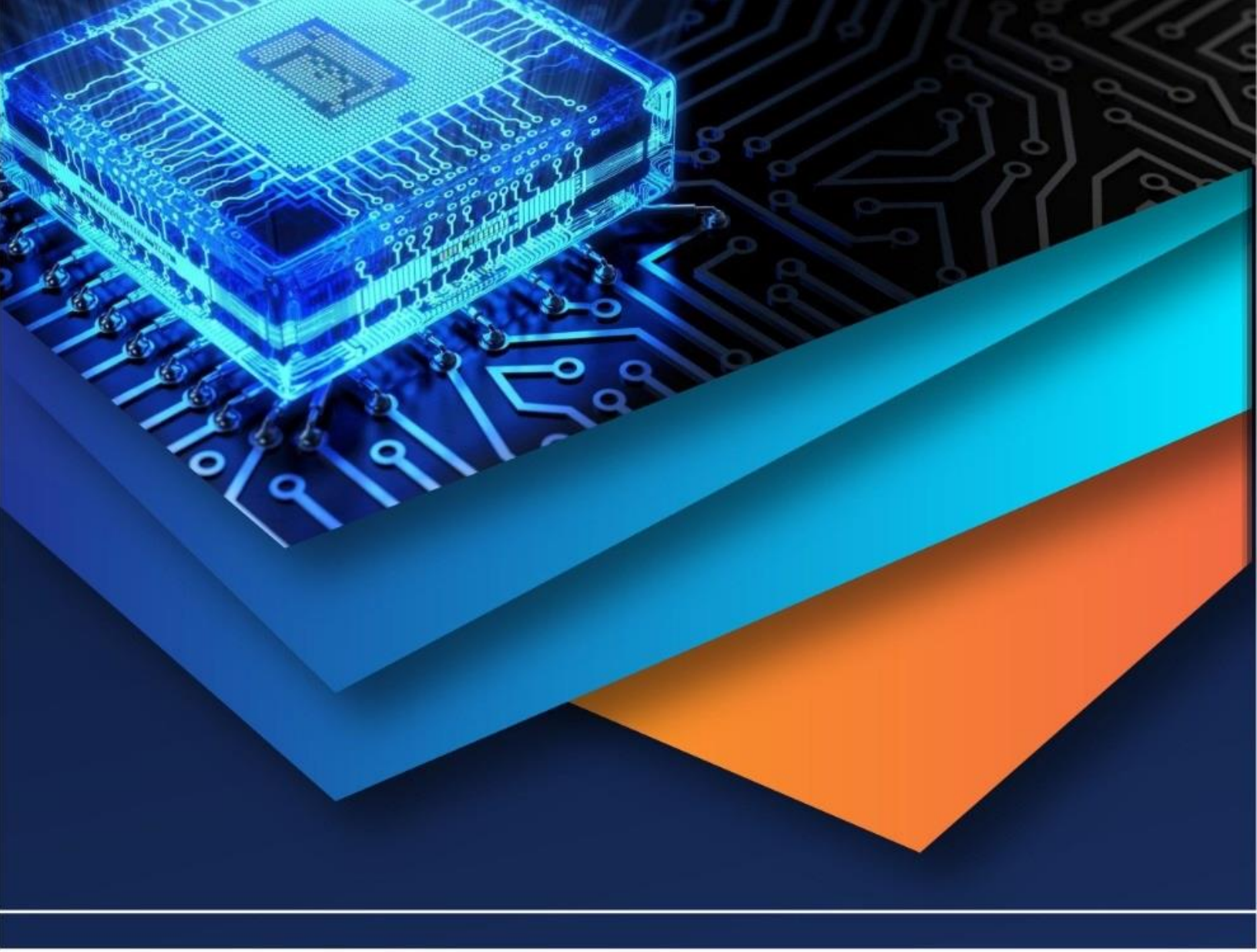

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