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## **INVESTIGATION THE EFFECT OF DEFORESTATION ON BIODIVERSITY**

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### **ABSTRACT**

This list includes the most pressing threats to Amazonian biodiversity. Deforestation and agricultural expansion resulted from occupation and land usage. Brazil has quickly industrialized since the 1950s and is now adapting to economic globalization. Intensive cattle-raising and agriculture, a lack of territorial planning, official agencies promoting monoculture of specific crops, and foreign species introduction through cultivation are affecting Amazonian biodiversity. Preserving local ecosystems requires a greater understanding of them, yet there are still many gaps. Unfortunately, strong media and legal agencies promote distortion, illiteracy, and misinformation, hindering our probe. Annual avian and primate losses are estimated to be over ten times the number of animals illegally sold for meat worldwide. According to research for certain creatures, deforestation wastes natural resources like this. Reversing this scenario requires more organized and rigorous study, uniting current and new research groups, and a willingness to stop Amazonian rainforest destruction.

Keywords:

### **Introduction**

The world's climates and forests are intimately interlinked. Dense communities of tree species can only grow in environments with sufficient soil water. Where mean annual precipitation is

less than about one meter, continuous forests are commonly replaced by smaller woody vegetation grasslands or deserts. In these dry regions tree stands and forests may only be found in topographic depressions where water accumulates and is stored well into the dry season, e.g. along river beds and in periodic floodplains Likewise, primary productivity in forests is principally related to rainfall as well as temperature, ranging from averages of about 2200 g m<sup>-2</sup> yr<sup>-1</sup> in lush tropical rainforests (trees of more than 30 m height and mean woody biomass of around 45 kg m<sup>-2</sup>) to 800 g m<sup>-2</sup> yr<sup>-1</sup> in the northern taiga forests Seasonal weather patterns also influence tree physiology and determine the distribution of forest biomes, e.g. temperate deciduous forests occur in regions characterized by cold winters, whereas dry deciduous forests are widespread in parts of South and Southeast Asia that are influenced by the monsoon. The growing season of these vast deciduous northern forests is reflected as a small seasonal decrease in atmospheric carbon dioxide measured at weather stations around the northern hemisphere.

### **Biodiversity of Ivory Coast**

The different climatic zones, the peculiarities of the relief and human influences, determine several groups of vegetal landscapes in the Ivory Coast. As a result, like most tropical countries, Côte d'Ivoire is characterized by diverse ecosystems. Three distinct biogeographical zones can be distinguished from south to north: the south and west zone, below the 8th parallel, excluding the V-Baoulé, has long been characterized by primary forest (rain forest) It includes: coastal forest made up of more or less halophilic species and mangrove forest along the country's lagoon systems, lowland rainforest or evergreen, and mountain forests and savannas. The Sudanese and South Sudanese savannah zone, above the 9th parallel, with corridors of gallery forests and its open forests is made up of tree and shrub savannas Between these two zones is the transition or pre-forest zone with the V-Baoulé. It has a mosaic of backgrounds. We also note the zone of mesophilic (or semi-deciduous) forest. These different plant landscapes provide Ivory Coast with a diversity of ecosystems. Indeed, these environments are subdivided into continental (terrestrial) ecosystems and marine ecosystems.

### **Objective**

1. the sustainability of biodiversity in Mesoamerican Biological Corridor.
2. Deforestation and threat to biodiversity in developing countries: case of ivory coast

### **Materials and methods**

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For mapping the biodiversity of Ivory Coast, computer tools and cartographic software such as ArcGIS, QGIS, Google Earth are used to have a global and synthetic view of the study. For the smooth analysis, several documents relating to the effects of urbanization on the ecosystems have been consulted. Such literature review from relevant documents has provided information relating to study area and related aspects. This aimed on the one hand to supplement the information obtained through the documentary research and on the other hand to validate certain information that have been obtained through the literature. Secondary data and information have been distilled to depict the issue of deforestation and its impacts on the biodiversity in Ivory Coast.

## **Results**

### **The direct causes of deforestation**

Deforestation is the conversion of a forest to another form of land use or the long-term reduction of the canopy below a 10% threshold. Deforestation causes permanent or long-term loss of forest cover and transformation of the area for another use. Ivory Coast lost more than 85% of its forest cover between 1880 and 2008, mainly under the joint effect of agricultural expansion and logging. It is one of the tropical countries with the highest rates of deforestation. The economic development of the Ivory Coast relies heavily on agriculture. As a result, Ivorian forests are not immune to this phenomenon of deforestation. Production is strongly focused on export crops. In the background come food crops such as rice, yams, plantains, cassava and maize. Cocoa and coffee are the two export crops par excellence of the Ivory Coast. However, the development of this plantation economy took place par excellence in the forest regions. Starting from the east in the 1880s, this economy spread east-west, particularly south-west through the center-west. However, agriculture is the greatest source of pressure on biological diversity in the south of the country, which includes 65% of farms (having coffee, cocoa, rubber, pineapple, palm oil). Agriculture is still in many cases archaic. The slash-and-burn system and the need to use the fertile soil in forest areas is very destructive of forest and in degraded areas it is a source of uncontrolled fires. Cash crops themselves consume large areas. In 1965, agricultural speculations covered a total area of 1,900,000 ha, or 6% of the national territory. In 1975, they occupied 11% and in 1990, 23% or 7,500,000 ha. In such a context, agriculture will continue to be a factor of deforestation given the evolution of cultivated areas over the years.

Logging for timber production has grown at a rapid pace not only to fuel the local timber processing industry, but also for the export of timber. Lumbering and the activities of the timber sector have played and continue to play an important role in the Ivorian economy well

beyond a direct contribution to the GDP which remains below 2% for the timber industry. Third export product for more than twenty years, this unsustainable exploitation accelerates the disappearance of forests, and de facto of the fauna within them. Anarchic logging is well beyond the capacity to renew the resource, timber for export and industry (on average 3 million m<sup>3</sup> of logs per year between 1969 and 1974) occurs in rural areas as well as in most classified forests and in national parks. Rogue loggers illegally exploit forest resources. Unfortunately, these bad practices are often carried out with the complicity of neighbouring populations or that of the forestry services close to the borders. There is therefore a lack of collaboration between the border services of different countries, as well as an insufficiency in the control mechanism of these services. This situation contributes to deforestation.

Every year, the savannah area and some forest regions are devastated by bush fires. They are often caused by humans as part of hunting practices, renewal of pastures (breeders), preparation of cropland (farmers). Fires are also used by some park managers for the control and maintenance of vegetation, especially savannah, and for the management of pastures for wild herbivorous fauna. According to the National Committee for the Defence of Forests Against Bush Fires (CNDFB), 70,530 ha. of FC were destroyed by bush fires, as well as 311,665 ha of the rural domain between 1983 and 2004.

The collection of fuelwoods and the manufacture of charcoal is very large (as gas is not widely used outside urban centres), and very destructive for the forest resource which escapes any control by the forest administration. It estimated the fuelwood removal of 11 million m<sup>3</sup>. These collection methods are linked in particular to the lack of diversification of energy sources.

### **Indirect causes of deforestation**

Along with the direct causes, other underlying, but equally important, causes have a negative impact on the management of forest resources. These are the weakness of the steering of the policies undertaken and the bad governance; Lack of coordination between forestry policy and other sectoral policies; Lack of land security and demographic pressure (migration and growth); As well as the socio-political crises and political instability of 2002 and 2010 years.

Demography, immigration and poverty; with a population of 4 million in 1960, the Ivory Coast had a count of around 23 million in the last census in 2014. The country is characterized by the presence of a significant proportion of foreign population on its soil. The geographic distribution of the population shows an imbalance between the forest zone located in the southern half of the country (78% of the total population) and the savannah zone (22%). This large, predominantly agricultural population puts great pressure on agricultural land, thus contributing to deforestation. In addition, uncontrolled population growth accentuates poverty

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and consequently an even greater flow migrate to forest lands which represent illegal but "free" land reserves for agriculture. With the degradation of the soil and the aging of the plantations, there is a drop in the standard of living of the said populations and a shift in the coffee-cocoa loop. This amplifies deforestation in order to create new, more productive plantations. According to Brou (2004), the country's climatic distribution is closely related to the distribution of plants. The success of cash crops depends closely on climatic conditions. The disappearance of the forest cover would impact not only a forestry sector, already in crisis, but more broadly the cocoa, rubber and rice producing areas. Generally, the resources available to forest management organizations are largely insufficient (surveillance, reforestation, firefighting, etc.). This has led to a lack of monitoring of operations in the forest. It is also observed that laxity, non-monitoring of infringements leading to the waste of reforestation actions and destruction of forests. Anti-infiltration actions are rarely supported by the police. SODEFOR can no longer fight alone against thousands of infiltrators.

Likewise, ambitious reforestation programs are impossible with current human and financial resources. Multiple reforestation projects, mapping, studies of the causes of various phenomena involved in maintaining forest cover are blocked or do not see the light of day for lack of funding. An inconsistency between the policies of the ministries which has led to contradictions, in particular in the management of infiltrators in classified forests. In addition, there is competition between the Ministry of Water and Forests in charge of protecting classified forests, and the Ministry in charge of the environment, which manages parks and reserves, which are also forests. This underlines the need to coordinate and harmonize all these policies having an impact on forest resources .

## **Discussions**

### **The impact of deforestation on biodiversity**

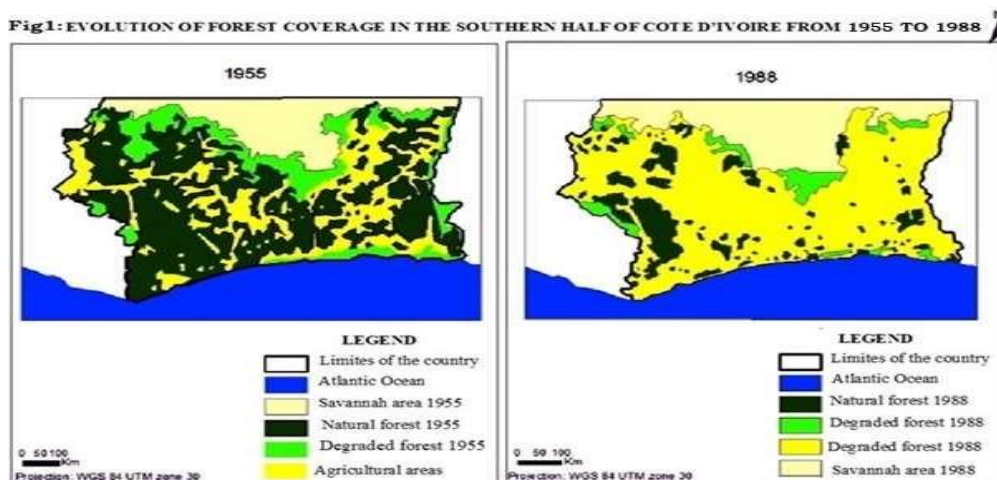
#### **Loss of forest cover**

Having specialized in agriculture and forestry since colonial times, the independent Ivory Coast has based its development on agriculture. This resulted in a gradual loss of its forest heritage. Indeed, the slogan of the first President of the Republic of Côte d'Ivoire, "the land belongs to the one who develops it", has since the 1960s reinforced the "race for the forest" of planters (indigenous and foreigners), who wanted to consolidate their land base and mark their property rights through clearing and hasty planting. This practice was guided by the following logic: "if I do not exploit today, another will come to do it before me". The absence of authoritarian and exclusive management by the state has therefore resulted in free access and a race for resources. Ivory Coast now has only two million hectares of forests, almost 90% less than in the

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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. Declining forest cover in general and situation of urban forest of Banco National Park in Abidjan in particular depicts a dismal picture.

The Ivorian Forest, which occupied the entire southern half of the country, suffered a more accelerated loss from the 1970s. Thus, if according to the most optimistic estimates, only 2.7 million hectares would remain, at the current rate of deforestation, Ivory Coast is expected to lose all of its national forest cover by 2034. Today, the dense humid forest represents only 2 million hectares of natural forest. Over the past ten years (1981 to 1991), the average rate of deforestation has been 0.89% per year So, despite growing concerns around the world about forest destruction, losses have continued to accelerate. The annual rate of deforestation has been estimated at 3.5% over the period 1980-2008, which is one of the highest in the world. Already, between 1955 and 1988, deforestation reached an alarming level. The map below clearly shows the speed with which the forest areas in the south of the country have been transformed into agricultural areas.



Source: OIPR 2009

Indeed, the forests of the protected areas of Ivory Coast are subject to strong pressures, likely to call into question their future. These last witnesses of the important Ivorian forest cover continue to decline and deteriorate. The socio-political crisis of 2002 accelerated the situation further. Protected areas were seen as a space to be occupied for agriculture and which furthermore contained an abundant market resource. The rate of degradation of these habitats varied from one area to another: Taï Park (less than 1%), Marahoué Park (between 20 and 50%). The degradation of classified forests has also been very significant, with average rate of



forest degradation varying between 40 and 50% of the area of each forest. The areas of agricultural plantations located in classified forests amounted to 630,119 ha in 1999, amongst these cash crops are the most important including coffee, cocoa, rubber, etc.

### **The decline of flora and fauna**

This deforestation is the cause of the destruction of habitats of animal and plant species, habitat fragmentation, biological invasions and overexploitation of wildlife resources, often doomed to disappear. Linked largely to the shifting slash-and-burn system, the growth of traditional agricultural production continues to this day at the cost of particularly rapid deforestation. The development of export agriculture has been all the more devastating for biological diversity as it has mainly taken place in the south of the country, an area of extensive forest ecosystems, whose biological richness is known. The consequences of this agricultural development are the loss and fragmentation of insulating natural environments. The impact on wildlife ranges from the impoverishment of certain animal populations to the local extinction of species: Elephant, Lion, Panther, Jentink's Duiker, Dwarf Hippopotamus, Chimpanzee, Monkey etc. Today, some protected areas are relegated to "paper reserves" because they have been destroyed or invaded by populations of foreign origins, as is the case for the Marahoué or Mont Péko National Park. Thus, in 2008, the following losses on biodiversity were estimated as out of the 232 species of animals, 26 are classified by the IUCN as rare or threatened with extinction, including some antelopes, 4 species of primates and the pygmy hippopotamus; amongst birds, 7 species of forest birds are threatened with extinction and 59 are listed in the IUCN endangered species category; for reptiles, 3 species of crocodiles and sea turtles have reached critical levels; and among amphibians in the forest area, 8 species have been considered endangered, including two endemic species in the southwest of the country. Concerning the flora, from 1960 to the present day, 26 species of vascular plants have disappeared or are only encountered nowadays. 70 species are endangered or become rare because of overexploitation or because their specific sites are disturbed. Mangroves constitute a buffer environment between the lagoon waters, directly in contact with the sea and the mainland. Consequently, these ecosystems are linked to seasonal inputs and movements of fresh, lagoon and marine waters. Unfortunately, they are currently experiencing various threats with the immediate consequence of destroying this biotope. Besides this, the exploitation of mangrove woods for services is also increasing. Thus, the exploitation rate estimated at less than 20% in the 1980s reaches in places 60 to 80% after 2004.

### **National Forest Protection System**

### **International conventions**

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In the report of MINISTRY OF THE ENVIRONMENT AND LIFE FRAMEWORK (2018) Ivory Coast's commitment to the protection of its environment in general has been manifested nationally and internationally. At the international level, its action has resulted in the accession to numerous international conventions, including those relating to: wetlands of international importance, particularly as waterfowl habitat (Ramsar, February 1971 - accession in February 1993, ratification in 1996), the protection of world, cultural and natural heritage (Paris, November 1972 - accession in November 1977), international trade in endangered species of wild fauna and flora (CITES, March 1973 - accession in November 1994) , conservation of migratory species belonging to wild fauna (Bonn Convention, June 1979 - signatory, ratification procedure in progress), biological diversity (Rio De Junero, June 1992 - ratification in November 1994), climate change (Rio De Junero , June 1992 - ratification in November 1994), to the fight against desertification in countries seriously affected by drought and / or desertification, particularly in Africa (Paris, June 1994 ratification in May 1997). More recently, the country participated in the last two climate conferences, namely COP 21 from November 30 to December 12, 2015 in Paris and COP 22 from November 7 to 18, 2016 in Marrakesh, Morocco.

### **National Legal and institutional measures**

Beyond its international involvement, the governments have set up legal and institutional standards to allow the conservation of natural resources but also a sustainable use of its forest resources. Having realized the importance of good management of forest resources, the Ivorian government has been engaged in recent years in a profound reform of the texts regulating the sector which resulted in the publication of Law No. 2014-427. of July 14, 2014 on the forest code. Forest regulations in Ivory Coast were based until 2014 on two important laws: Law No. 65-255 of August 4, 1965, relating to the protection of wildlife and the practice of hunting and Law No. 65-425 of December 20, 1965, establishing the forestry code. It defined not only the forests as well as the protection and reforestation areas, but also the various categories of rights applicable in the forestry sector, including the issuance of logging concessions in forests in the State domain [27]. The Ivorian forests are divided into two domains according to decree no. 78-231 of March 15, 1978: The Rural Forest Domain, in which priority is given to the development of agriculture and The Permanent Forest Estate of the State (DFPE), which brings together all classified forests (FC), national parks, reserves and protection perimeters. Thus, the Ivory Coast has a network of 13 protected areas made up of eight national parks and five nature reserves. The reform of logging, introduced by decree no. 94-368 of 1 July 1994 stipulates that logging is now theoretically practiced below the 8th parallel through logging perimeters, with an area of minimum of 25,000 ha in the rural area, instead of the temporary exploitation permits (PTE) of 2,500 ha, which dated from 1966 and through conventions in classified forests. In a

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very synthetic way, the forest code 2014 replaces the forest code of 1965 which is unsuited to the new socio-economic, technical and environmental requirements of the Ivory Coast. This text introduces new rules and more particularly, it introduces a new definition of the forest and takes into account all the socioeconomic, educational, tourist, scientific and environmental dimensions of forests through a classification based on the classified forest domain on the one hand and on the other, on the protected forest domain [28]. We also have the co-management which is being used in Banco National Park; To curb the exploitation of wood and non-wood resources as well as poaching, comanagement (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 neighborhoods' hostels are set up and managed by a local workforce recruited from women and young people.

## **Conclusion**

At the time of writing this chapter the effects of deforestation and other types of anthropogenic habitat losses and degradation on the earth's biodiversity are still far more dramatic than the current effects of global climate change; until now only a few species are thought to have gone extinct as a direct result of climatic changes. However, also at the time of writing this chapter, the specter of slowly rising temperatures and increasing frequencies of weather extremes is once again rising in human consciousness as communities around the world stand witness to new heat waves in Eurasia and North America, hazes stemming from blasting forest and smoldering peat fires of previously unseen extent in Russia, and the worst flooding disasters in Pakistan since more than 60 years. Climate change science is a heated business. Much of it is still based on computer-aided projections that depend on the parameters of our current (limited) understanding and beliefs. Given the dimensions of what is at stake, scientists' climate change debates are exposed to open publicity and politics with a danger to overheat and jump the rails. In the rich countries climate change skepticism may stifle determined and swift action by politicians to promote carbon-free societies – a development that will have to come at any rate as fossil fuels are gradually being depleted and continue to be spilled in disastrous ways. In poorer countries, on the other hand, the 'climate change hype' may distract attention away from a large array of more 'conventional' and much more immediately pressing risks that may be summarized under the caption 'population increases and unsustainable land use practices'.

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