



## Harmful Effects of the Exploitation of Natural Resources by the Populations of The Bédiala Sub-Prefecture (Center-West Ivoirien)

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**ABSTRACT:** *Aware of the seriousness of the environmental problems, the Ivorian authorities have for decades undertaken several actions to resolve the thorny problem of deforestation, by creating a specific ministry and technical structures. Despite these initiatives, human pressure on natural resources continues to grow. At the level of the Bédiala sub-prefecture, the abusive exploitation of natural resources by the populations is intensifying. This study aims to show the harmful impacts linked to the excessive exploitation of natural resources by the populations of Bédiala. The method is based on the field survey, direct observation, interview, and a questionnaire sent to the various operators of natural resources. The results show a relatively large share of farmers in the exploitation of natural resources, or 27%. The actors contribute to deforestation and the degradation of resources. However, stakeholders are aware of the need to preserve these natural resources and are ready to engage in actions in favor of environmental protection for sustainable development.*

**KEYWORDS :** *Natural resources, impact, deforestation, Bédiala, Côte d'Ivoire.*

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### I. INTRODUCTION

The degradation of the earth's environment by human activities has increased since the industrial revolution [1]. From this period, we observed more and more modifications of the biophysical and human environment attributable to human production activities. This situation led to the worldwide manifestation of interest in the environment, for the first time in June 1972, with the United Nations conference on the subject in Stockholm (Stockholm declaration). The environment emerged as a "common good" in June 1992 at the Earth Summit in Rio de Janeiro.

Thus, there has been an awareness that the environmental problem cannot be dissociated from economic, ecological and social problems, so that the environment has been considered as a denominator of the three pillars of sustainable development [2].

In this sense, various strategies and initiatives have been put in place in Côte d'Ivoire, with for example in the field of wildlife resources, the ban on hunting in 1974, because the role of wildlife is not to be

demonstrated. ecologically (seed dispersal, plant pollination, etc.), economic development (all actors in the bushmeat sector), food security (main source of protein for most rural populations), medicine traditional (the use of products or parts of animals for care). Regarding forest resources, the state has created and conserved a network of protected areas, made up of 8 national parks covering 18,568 km<sup>2</sup> and 6 reserves covering 3,396 km<sup>2</sup>. In 2014, Côte d'Ivoire also adopted a new forestry code. This reflects the government's desire to protect the environment, in particular the sharply declining forest cover.

However, the observation is that these regulations are not respected and the Bédiala sub-prefecture is not on the sidelines of this situation. Natural resources are subject to strong anthropogenic pressures likely to call into question their future. The direct factors of pressure on fauna, water and forests are particularly, in the order of their relative importance: poaching, the expansion of agriculture in particular cash crops with the use of pesticides (cocoa, coffee, rubber, cashew), shifting food crops using the fertility of forest soils and fallow land (rice, yam) and uncontrolled bush fires. But also, other no less important causes such as the exploitation of wood turned towards the export of logs and processed products, then the overexploitation by households of fuelwood.

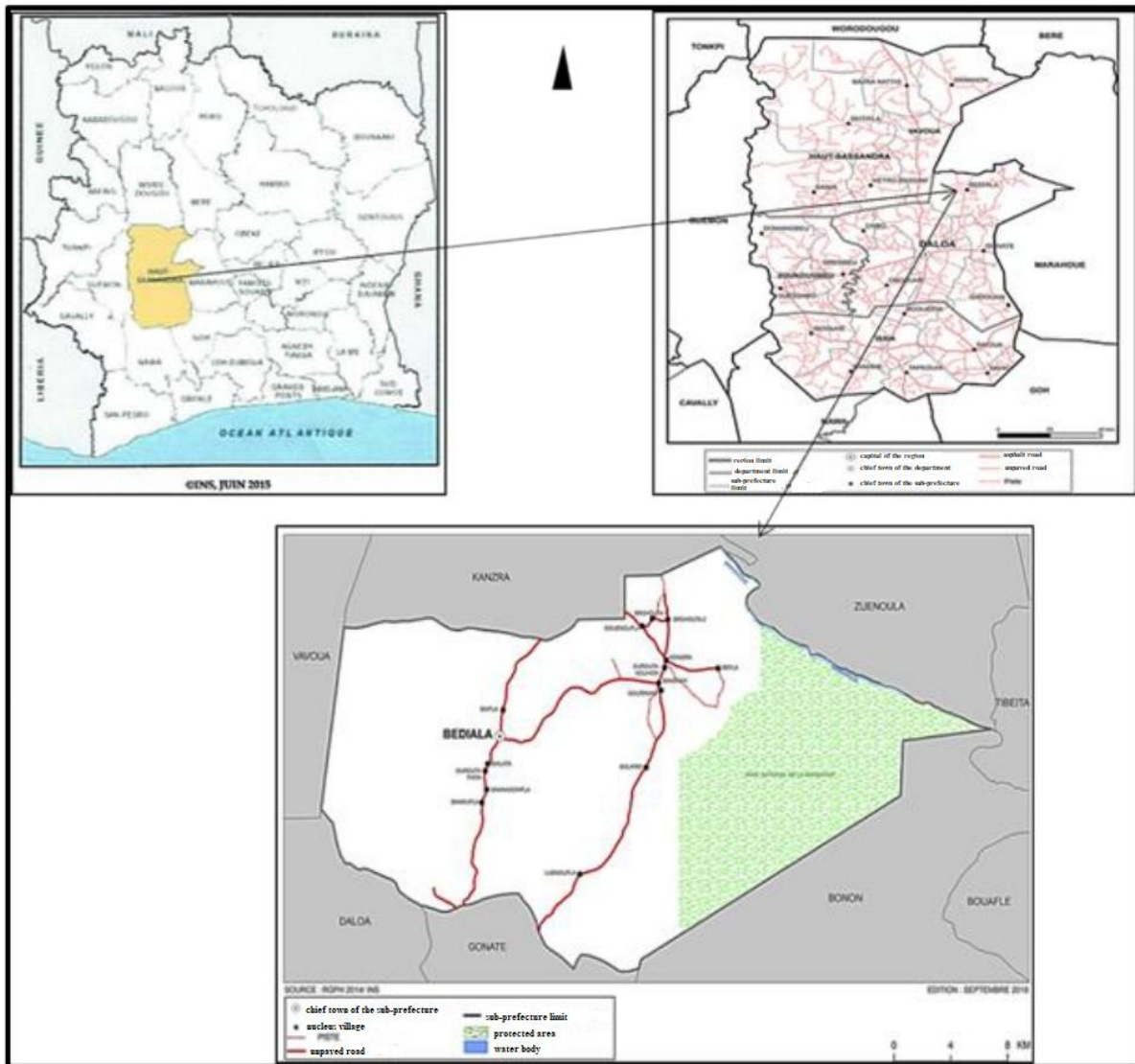
The situation worsened with the politico-military crises of 2002 and 2011, during which agents responsible for the preservation of protected areas and classified forests moved to the south of the country. This has contributed to the abuse of natural resources.

In the Bédiala sub-prefecture, rural households and economic actors abuse natural resources to meet their domestic and economic needs. Therefore, the question is to know, what are the socio-environmental problems linked to the exploitation of natural resources by the populations of Bédiala. To this concern, the study aims to provide answers, by first identifying the actors who use natural resources, then determining the harmful impacts on the social and natural environment, and finally analyzing the strategies to be adopted for a sustainable management of natural resources.

## **II. MATERIALS AND METHODS**

### **2.1 Presentation of the study area**

Located in the center-west of Côte d'Ivoire (7 ° to 6 ° west longitude and 7 ° to 8 ° north latitude), precisely in the Haut-Sassandra region, the Bédiala sub-prefecture is built in capital of the sub-prefecture in 1980. It is limited to the north-west by the sub-prefecture of Vavoua. To the north-east by the Sub-prefecture of Zuénoula, to the south-east by the Sub-prefecture of Bonon and to the south-west by the sub-prefectures of Gonaté and Daloa (figure 1).



**Figure 1:** Presentation of the Bédiala sub-prefecture(Source: INS, 2014)

The Bédiala sub-prefecture benefits from favorable natural conditions for its economic development. The climate is mild and rainy, the vegetation mainly consists of forest. The relief is relatively flat and the soils are fertile. The hydrographic network is dense, and characterized by the Marahoué or White Bandama River, essential for fishing and agriculture. It is next to the Marahoué National Park, a protected area created in 1968. It is very large with an area of 101,000 hectares and the presence of many plant and animal species [3].

43 kilometers from Daloa, the Bédiala sub-prefecture covers an area of 1,129 km<sup>2</sup> and has approximately more than 23 villages and 1,176 camps for a population of 81,193 inhabitants [4]. The Bédiala sub-prefecture is the seat of a real cultural mix between the Gouro and the Bété (indigenous peoples) and the Baoulés, the Sénoufo, the Malinké, the Lobi (allochthonous) and a large foreign community, who have come to settle. in the area in search of forest land.

## 2.2 Method of data collection

A methodological approach was adopted in order to achieve the objectives of the study. This approach consisted mainly of documentary research, field observation, interviews and a questionnaire survey. The documentary research focused on the consultation of general books, dissertations, scientific articles, theses and study reports.

Regarding the field survey, several techniques were used. The field observation made it possible to observe the economic activities of populations destroying natural resources. These observations were supported by shots for the illustrations. In addition, interviews were carried out with the Sub-Prefect of Bédiala, the technical department of the Town Hall, the Department of Water and Forests, and village community leaders.

A questionnaire survey was carried out among heads of household through a previously established questionnaire. To determine the size of the sample of households to be surveyed, the non-probabilistic formula based on reasoned choice was used.

Due to the clandestinely in which certain activities are carried out, secondary data collected in administrative structures have shown that there is no reliable statistics on the population. Thus, we proposed to interview 30 heads of households. However, given the reluctance and hostility of some respondents, the questions were directed to those who kind were enough to respond.

The objective of choosing the different categories of people is to understand the social and environmental implications of each activity in order to better appreciate the related issues. Table 1 shows the distribution of households surveyed by sector of activity.

Activities Staff	Numbers
restorer	03
Firewood merchants	11
Carpenters	03
Farmers	08
Housewives	02
Shoemaker	01
Upholsterers	01
Sawmill	01
<b>Total</b>	<b>30</b>

**Table 1:** Distribution of respondents by sector of activity (Source: Field survey, October 2021)

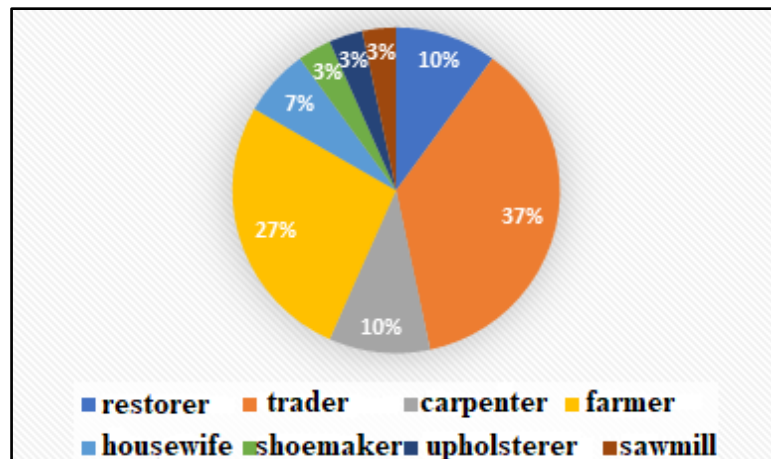
A total of 30 people were surveyed according to their activity. Initially, we chose to survey 10 individuals per domain, that is to say the artisanal domain (10), the industrial domain (10), and households (10). But in the field, we found that there was only one semi-industrial activity. So, we distributed the nine (9) other people on the other activities. To properly conduct our study, we drew up a work plan which consisted of constituting 4 work zones: Bédiala-Ouest, Bédiala-Est, Nanoufla-Ouest and Nanoufla-Est.

### III. RESULTS

#### 3.1 A plurality of actors using natural resources for their needs

##### 3.1.1 The typology of actors who exploit natural resources in Bédiala

The people surveyed engage in several types of economic activity and exploit natural resources in Bédiala. Figure 2 reveals that there are several types of actors who exploit natural resources for their needs. The firewood traders represent 37% of the actors who exploit the wood. The latter sell this wood to restaurateurs and households. After the Traders, come respectively the Farmers 27%, Carpenters 10%, Shoemakers 03% and Upholsterers 03%. These actors use raw materials from flora and fauna, namely wood and animal skins. Industrial activity (sawmill) is weak there because it represents 03%. In addition, restaurateurs represent 10% of the players. These sell bushmeat, including rats, agoutis, hinds, gazelles, etc. 07% of households use wood for cooking.



**Figure 2:** Distribution of respondents by type of activity (Source: Field survey, October 2021)



The wood sawing unit generates artisanal activities that consume products from the sawmill. This wood is sawn in a sawmill at the Bédiala market (photo 1). These include carpentry, carpentry, cabinet making. This resource is also used by real estate developers. Photo 2 shows the timber trade in Nanoufla, a district of Bédiala.



**Photo 1:** A semi-industrial sawing unit



**Photo 2:** Sale of timber in Nanoufla (Bédiala) Of wood (Source: Field survey, October 2021)

### 3.1.2 Educational level of the households surveyed

Table 2 shows that the illiterate are the most numerous among the actors who exploit natural resources (50%). 26.66% have a primary level and 23.33%, the secondary level. Overall, all levels contribute to the destruction of natural resources because with the means at their disposal, people have no other alternative. Thus, one planter interviewed relates this: "If we don't cultivate, what are we going to eat? ". And another said, "Agriculture is not prohibited, we destroy the forest to plant cocoa". In total, the economic activities that exploit the natural resources in Bédiala are artisanal and industrial activities. But households are not left out in the exploitation of natural resources, because they use wood for energy but also consume bushmeat. Moreover, in the exploitation of plots for food crops and cash crops destroy vegetation and wildlife habitats. Most of these farmers are illiterate. They do not master the cultivation techniques. They practice extensive agriculture and slash-and-burn agriculture.

Educational level	Numbers	Percentage (%)
Illiterate	15	50
Primary	08	26,66
Secondary	07	23,33
<b>Total</b>	<b>30</b>	<b>100</b>

**Table 2:** Level of education of respondents (Source: Field survey, October 2021)

The cash crops found in the study area are cocoa, rubber, cashew, and oil palm. In addition to cash crops, people cultivate food crops, mainly fields of yams, cassava, maize, vegetables, and market gardening. Generally, the populations combine hunting and field work. In view of the results, the artisanal production activities, the timber trade, catering, agricultural and industrial activities help to support the various families of the locality of Bédiala.

The peasants practice traditional hunting. This hunting is done in two ways: with the rifle or by trapping. Photo 1 shows the capture of a squirrel by a trap in a cocoa plantation in Bédiala. This animal will serve as meat for the household. Logging, mining, and commercial poaching are also economic in nature. Indeed, it is the commercial nature that motivates operators. Poverty in rural areas, pushes people to any kind of initiative in order to obtain a gain to cover family expenses. Most often, these initiatives are taken to the detriment of the preservation of natural resources. The overexploitation of natural resources can lead to a significant decrease in their availability.



**Photo 3:** Hunting activity in a cocoa plantation (*Source: Field survey, October 2021*)

### 3.1.3 Natural resources from various horizons

Table 2 shows the places where wood is supplied to supply the semi-industrial sawmill in Bédiala. Thus, 56.66% of the wood comes from Bédiala and 43.33% from Daloa. However, one of the carpenters interviewed admitted that part of the raw material comes from the Marahoué National Park, which is a biodiversity reserve. “We are supplied by illegal sawyers in the Park”. Indeed, illegal loggers provide wood to the sawmill.

Place of origin	Numbers	Percentage (%)
Daloa	13	43,33
Bédiala	17	56,66
<b>Total</b>	<b>30</b>	<b>100</b>

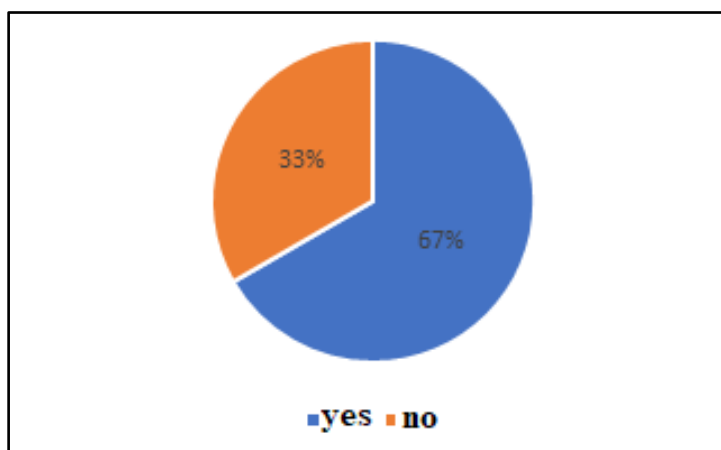
**Table 3:** Place of origin of the wood (*Source: Field survey, October 2021*)

### 3.2 A variety of harmful effects linked to the exploitation of natural resources by operators

The Ivory Coast has a rich flora and an important biological diversity. However, their modes of exploitation have led to a rapid degradation of these fauna and flora resources. The consequences linked to the destruction of natural resources are manifold.

#### 3.2.1 The scarcity of natural resources in Bédiala

The analysis in Figure 3 shows that respondents have difficulties in the supply of natural resources, especially wood. Of the 30 people surveyed, 67% admit that they have difficulty obtaining woody resources against 33% who do not have too many difficulties in obtaining them. Households admit that there is no more bundle, as the forest areas have been replaced by vast plantations of cocoa, rubber, cashew and palm oil. This remark is also made by loggers. This shows that natural resources are becoming increasingly scarce in the locality of Bédiala. In addition to short-term scarcity, the disappearance of natural resources will lead to: reduction in plant cover, soil hardness, soil erosion, disruption of wildlife habitats and their migration.



**Figure 3:** Difficulties in the supply of natural resources (*Source: Field survey, October 2021*)

### **3.2.2 The health and food safety risks associated with the use of wood for cooking**

Firewood is a source of energy from burning dry wood (bundle) for energy as a source of heat. This resource is generally collected by women in agricultural plantations, fallows and forests. It is a source of energy that is used in almost all rural localities in the Ivory Coast. It is widely used in rural areas in the sense that the populations of this area do not have the financial means to afford clean energies, such as butane gas. People use this type of energy for cooking food (photo 4). While the use of firewood for cooking can have harmful effects on health. Indeed, prolonged exposure and inhalation of fumes from the combustion of firewood by women and children can be harmful to their health.



**Photo 4:** Kitchen with firewood (*Source: Field survey, October 2021*)

In addition, the destruction of natural resources can result in a decrease in rainfall and yields of agricultural production. This could threaten food security in the locality of Bédiala in the long term. Faced with the harmful effects linked to the excessive exploitation of natural resources, it is necessary to plan strategies for the sustainable management of natural resources for future generations.

### **3.3 Need to adopt strategies for sustainable management of natural resources**

The degradation of natural resources can pose a threat to plant and animal species and even to humans. There is therefore a need to preserve them. The populations are aware of the destruction of natural resources. This is confirmed in Table 4. Indeed, out of 30 people questioned, 18 (ie 60%) are aware of the degradation of



the plant cover as a result of their activities. On the other hand, 12 people, or (40%) do not know the scope of their acts with regard to the destruction of forest resources. According to these, over time nature will reconstitute itself.

Environmental awareness	Numbers	Percentage (%)
Yes	18	60
No	12	40
<b>Total</b>	<b>30</b>	<b>100</b>

**Table 4:** Opinion of respondents on environmental awareness (Source: Field survey, October 2021)

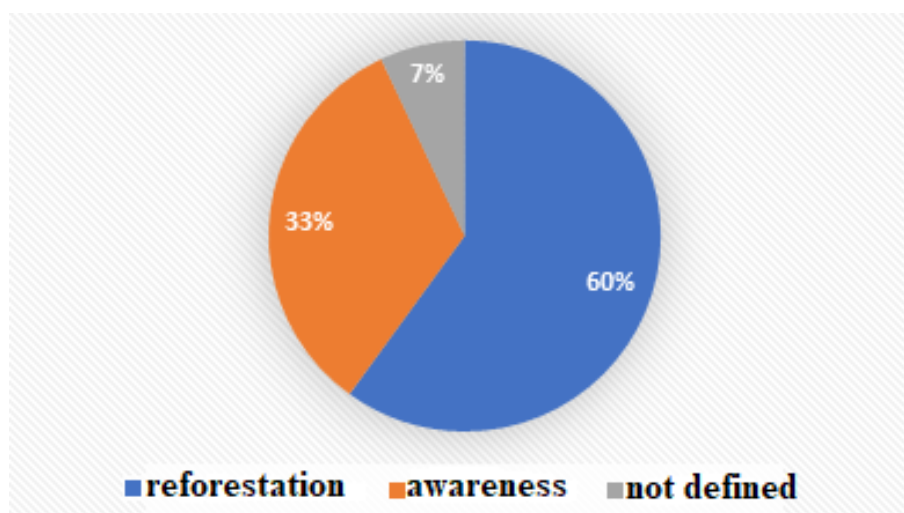
To reduce the excessive exploitation of natural resources, people are ready to commit to more harmonious development that respects the environment. Table 5 shows that 18 individuals or 60% of respondents say they are aware of the destruction of natural resources and therefore the destruction of the environment against 40% who say the opposite.

Contribution	Numbers	Percentage (%)
Yes	18	60
No	12	40
<b>Total</b>	<b>30</b>	<b>100</b>

**Table 5:** Distribution of respondents according to the contribution to the preservation of natural resources (Source: Field survey, October 2021)

In addition, the majority of the populations support the actions envisaged with a view to restoring the vegetation cover in the Bédiala sub-prefecture. Thus, Figure 4 shows that the populations willing to take actions in favor of the preservation of the environment and the conservation of nature. 60% of them are ready to embark on a reforestation operation, while 33% are thinking of regular awareness sessions for all stakeholders. 7% of those surveyed did not give their opinion. Reforestation and awareness are the two strong actions to be implemented in order to safeguard natural resources.

Awareness must be carried out through tools adapted to the environment, communication campaigns through posters, poster displays, films and the dissemination of information in the local media in the local language.



**Figure 4:** Mode of contribution to the protection of natural resources (Source: Field survey, October 2021)

The protection of natural resources should not be limited to flashy actions, but they should be continuous; so as to mark the spirit of the populations and instill in them new lifestyles, more respectful of the environment. Awareness of the preservation of natural resources must be translated into national policy. To do this, this policy must involve opinion leaders, religious guides, notables, and make extensive use of customary relays.



In addition, for the effective preservation of natural resources, effective law enforcement is needed. For example, limiting the number of permits, licenses and concessions; respect for the ban on the exploitation of resources in classified forests.

#### IV. DISCUSSION

This study analyzes the exploitation of natural resources and its negative consequences in the Bédiala sub-prefecture. Indeed, the problems linked to the management of the environment and natural resources constitute major challenges facing man. The degradation of forest ecosystems is one of the key elements [5] cited by [6]. According to [7], deforestation is a historical phenomenon. In fact, in the 1930s, the peasant populations of the Center (Baoulé) and the North (Sénoufo, Malinké) began to settle in forest areas to avoid compulsory recruitments in cotton-growing areas and opened small farms on the fringes. colonial plantations, integrating coffee and cocoa. He is joined by [8], who asserts that deforestation started there more than a century in the country. At the beginning of the 20th century, the project of "ruralization" of the Governor Angoulvants thus materialized beyond all expectations. This dynamic then accelerated under the leadership of Houphouët-Boigny, first President of the Republic of Côte d'Ivoire. Cocoa cultivation is carried out extensively, with very little use of improved varieties. Starting from the east in the 1880s, this economy spread east-west, particularly south-west through the center-west [9]. However, the destruction of plant cover is not the only fact of agricultural crops. For [10], beyond the aforementioned factors, there are also less publicized phenomena which exert strong land pressure on the last fertility reservoirs that are forests, and which deserve to be highlighted. This is, for example, the case of the acquisition or grabbing of land by private companies which can indirectly contribute to deforestation through the possible displacement of populations generated.

#### V. CONCLUSION

The degradation of natural resources in the Bédiala sub-prefecture, beyond posing a threat to its plant species, reduces its potential for carbon dioxide absorption, exposes its soils to significant erosion and promotes the creation of microclimates. This could be an effect on food security, exacerbation of the rural exodus due to the shrinking of usable surfaces, and security concerns. The depletion of natural resources constitutes a major threat to the satisfaction of the populations' domestic energy needs. There is therefore a need to implement a new policy for the preservation of natural resources, taking into account the socio-economic and cultural reality of the populations.

#### REFERENCE

- [1]. DIANA Cooper-Richet, 2019, la pollution à grande échelle a commencé au XIXe siècle, disponible sur <https://www.science-et-vie.com/paroles-d-experts/la-pollution-a-grande-echelle-a-commence-au-xixe-siecle-48140>
- [2]. Navarro JA et al. (2011) Overexpression of Human and Fly Frataxins in *Drosophila* Provokes Deleterious Effects at Biochemical, Physiological and Developmental Levels. *journal.pone*, Volume 6 Issue 7, pp. 1-10.
- [3]. OIPR, 2011, DECRET N° 2002-359 DU 24 JUILLET 2002, PORTANT CREATION, ORGANISATION ET FONCTIONNEMENT DE L'OFFICE IVOIRIEN DES PARCS ET RESERVES. Disponible sur <http://www.environnement.gouv.ci/structurea.php>
- [4]. INS, 2014, Recensement Général de la Population et de l'Habitat. Disponible sur <https://www.ins.ci/documents/RGPH2014>
- [5]. LANLY J.P, 1982, Les ressources forestières tropicales, FAO irrigation and drainage paper- No. 30
- [6]. KONAN K. E, 2012, Contribution of remote sensing and sig in the study of human pressure on the classified forest of Okromodou, southwestern Ivory Coast. in *Tropical Geography and Environment Review*, n° 1, 2015, 7p
- [7]. KIPRE Pierre, 2005, Les discours politiques de décembre 1999 à l'élection présidentielle d'octobre 2000 : thèmes, enjeux et confrontations, dans : Marc Le Pape éd., Côte d'Ivoire. L'année terrible 1999-2000. Paris, Karthala, « Les Afriques », 2003, p. 81-121.
- [8]. Desdoigts & A Kouadio, H., 2012, Déforestation, migrations, saturation et réformes foncières: La Côte d'Ivoire entre résilience rurale et litiges fonciers. MPRA Paper 49938, Munich: University Library of Munich.
- [9]. MAFOU Kouassi Combo & KONAN Kouadio Eugène, 2015, apport de la télédétection et des sig dans l'étude de la pression humaine sur la forêt classée d'Okromodou, sud-ouest ivoirien. *Revue de Géographie Tropicale et d'Environnement*, n° 1, pp. 40-46
- [10]. GRAIN, 2016 : Accaparement mondial des terres en 2016 – Ampleur et impact, 12 p
- [11]. Disponible <http://www.farmlandgrab.org/post/view/26318-accaparement-mondial-des-terresagricoles-en-2016-ampleur-et-impact>