

Analysis of Anthropogenic Pressure in the UFA Pokola Production Series, Sangha, Congo

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ABSTRACT

The phenomenon of anthropization of the production series of the Pokola forest management unit is an acute problem. This study aimed, among other things, to analyze the anthropogenic pressure of local communities and indigenous populations (CLPA) in the production series as well as to suggest prospects for improving this phenomenon. Data collection and analysis favored a qualitative rather than a quantitative approach. It appears from this study that this phenomenon is due to the difficulty of access to agricultural land in the municipality of Pokola, the increased demand for agricultural products, the lack of land subdivision in the municipality of Pokola, etc. Despite knowing the limits of the community development series (62%) and given the demographic and spatial growth of the municipality of Pokola, some CLPAs are forced to carry out their activities in the production series, an area reserved for production. lumber. Illegal occupations concern food crops and cash crops which are the origin of forest clearing, camps and some dwellings. Better management of access to land in the community development series is necessary to mitigate this phenomenon.

Keywords: Anthropogenic Pressure, CLPA, Congo, Production Series, Rights Of Use.

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I. INTRODUCTION

In the Congo Basin, the sustainable management and certification of forest concessions have become a major priority in the exploitation of forest resources, shared by all stakeholders, both in the public sector, the private sector, civil society than by local communities and indigenous peoples (FAO, 2010). Cameroon, Gabon, Equatorial Guinea, Central African Republic, Democratic Republic of Congo and Republic of Congo share the Congo Basin ecosystem. About 57% of it is covered by forest, the second largest area of tropical forest in the world after that of the Amazon (FAO, 2010).

Extending on both sides of the equator, the forest domain of the Republic of Congo covers an area of more than 22 million hectares, i.e. more than 60% of the national territory and 11% of the forest cover of Central Africa (FAO, 2010). The forests of the Republic of Congo provide valuable ecological services, such as the production of timber and non-timber forest products that are essential for humans. The man who lives around this forest must enjoy the goods and services offered by the forest: the rights of use (Anonymous, 2020). Usage rights are “the rights resulting from local custom or traditions by which the local community or indigenous populations can, in a forest that does not belong to them, either take certain products or engage in certain productive activities intended for sale or not within the limit of the satisfaction of their vital or customary domestic needs”. Forest management activities are the responsibility of public administration, the private or parapublic sector and rural communities that have user rights. (N’Zala, 2002).

Although the right of use is regulated as specified in article 61 of law n°33-2020 of July 08, 2020 on the forest code: the rights of use are reserved for the satisfaction of the personal needs of their beneficiaries; their exercise is free. The current problem that arises is whether the local populations really know the limits of the community development series because many income-generating activities are currently carried out in the UFA Pokola production series. Indeed, this series is devoted according to the national directives of installation to the production of lumber contrary to the series of community development (SDC) whose objective is to satisfy the needs of the local populations in forest products and to improve their income, co-management would be the preferred form of participation. Despite the development of forest concessions in series, illegal occupations of timber production areas are observed in several FMUs. This phenomenon of anthropogenic pressure from local communities and indigenous populations in the production series of managed forest concessions reveals weaknesses in the planning and forest management process. In this context, what are the explanatory factors of the anthropogenic pressure of local communities and indigenous populations in the series of production of managed forest concessions?

The management model of CIB-Olam Agri, a pioneering company in forest management in Congo, and sustainable management certification (Mbété *et al.*, 2021) can be taken as an example to understand the problem of anthropogenic pressure relating to population growth in the production series of the Forest Management Unit (UFA) Pokola.

This study aims to contribute to a better knowledge of the anthropogenic pressure in the production series for sustainable participatory management of the natural resources of the UFA Pokola. Specifically, it aims to: identify the level of knowledge of local communities and indigenous people on the boundaries between the community development series and the production series; to analyze the phenomenon of anthropogenic pressure from local communities and indigenous populations in the UFA Pokola production series.

II. METHODOLOGY

A. Location and Boundaries of The Study Area

This study took place in the UFA Pokola in the department of Sangha in the north of the Republic of Congo. UFA Pokola was created by Order No. 3085 of June 24, 1974, in the application of Law No. 004/74 of January 4, 1974 on the Forest Code (former Forest Code). The limits of the UFA were confirmed in 1982 by decree n°1146 /MEF/SGEF/DF/BC of February 2, 1982 (Anonymous, 2007). UFA Pokola is located in zone II (Sangha) of the northern forest sector of Congo, in the administrative department of Sangha (Fig. 1). The limits of the UFA are defined by decrees n°2632/MEFPRH/DGEF/DF-SIAF of June 6, 2002 and n°2632 /MEFPRH/CAB of October 05, 2006. It is limited: to the north, by parallel 1 °50' N located 7 km north of the confluence of the Mbolo and Sangha rivers; to the west and south-west, by the Sangha River; to the east, by the Sangha-Likouala departmental boundary.

UFA Pokola has 452,200 ha, GIS area subdivided into development series with a series intended to meet the needs of local populations and indigenous populations: the community development series which has an area of 26,950 ha, 10 villages and about 23,000 inhabitants. On the 10 villages is added a commune in full exercise, the commune of Pokola.

B. Collection of Data

The collection of secondary data focused on the documentary review relating to logging in general and particularly on its social aspect. Available information on aspects of forest management, participatory management, presentation of UFA Pokola and these management series including the community development series (SDC), but also information on the anthropization of protected areas have been exploited. The preferred documentation in the context of this study concerns books, scientific articles, dissertations and doctoral theses, technical reports, but also legal texts related to forest management. This collection of secondary data was carried out within the large Library of the Marien NGOUABI University, the documentary funds of the CIB Olam Agri and resource persons, but also through websites.

The study took place in the localities of the UFA Pokola community development series, but also in the areas of the timber production series exposed to the illegal occupation of local communities and indigenous populations. (CLPA). These areas of illegal anthropization were selected after an exploratory mission by the social service of CIB Olam Agri. The criteria for including the sample of anthropization zones in the production series are: the presence of income-generating activities for Local Communities and Indigenous Peoples (CLPAs), the presence of camps, the regular presence of CLPAs other than permanent or temporary agents of CIB Olam Agri. Thus, the axes of the production series selected for this study are: Pokola – Mboua - Mboua axis, Pokola - PK12 axis and Pokola - Djaka - Loundougou axis.

The target population of the study is made up of Local Communities and Indigenous Peoples (CLPA) with income-generating activities and/or acting as agricultural labor in the UFA Pokola production series. Due to the absence of an exhaustive list of the population involved in the UFA Pokola production series, non-probability sampling was preferred.

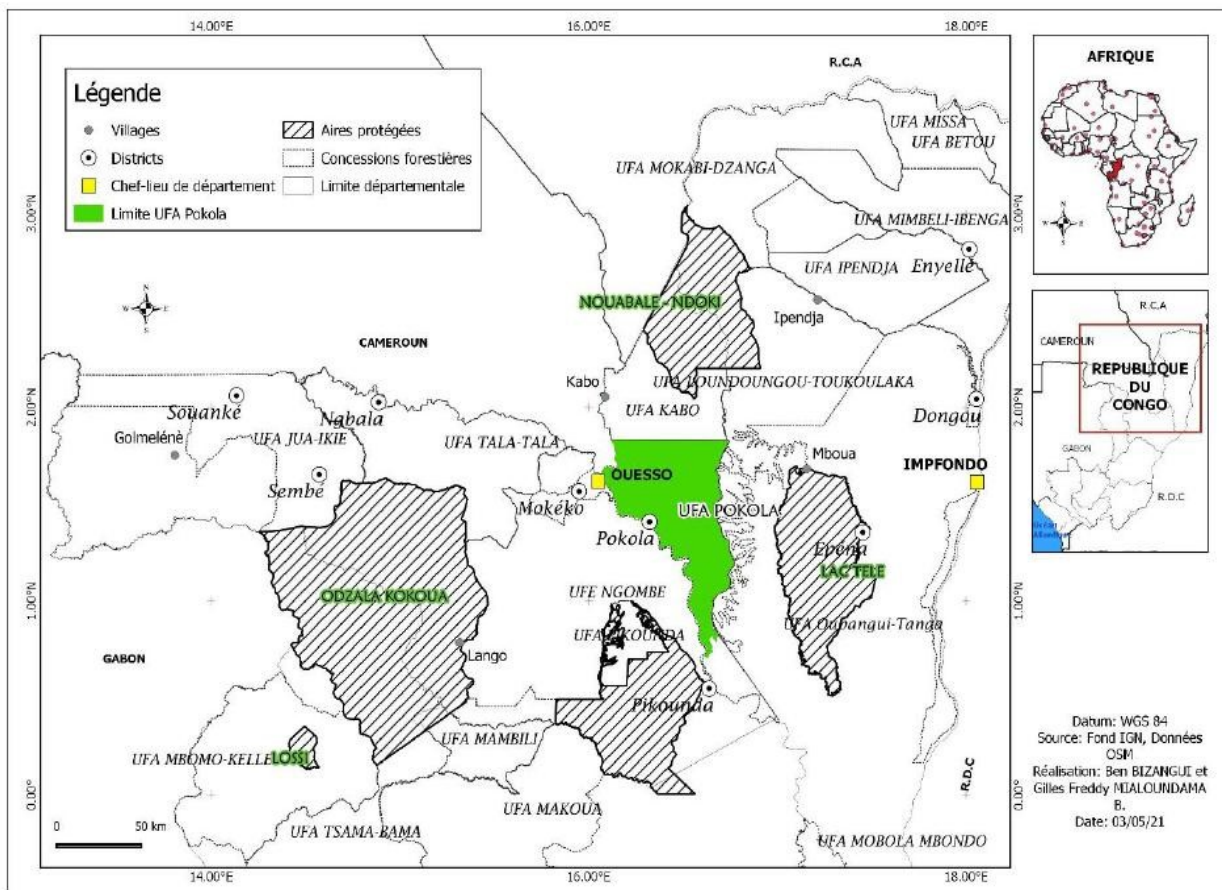


Fig 1. Location of UFA Pokola.

Thus, snowball sampling was chosen to constitute the sample of the target population. The local authorities (village chiefs) and/or the resource persons, orient towards the first people having activities or intervening as labor in the production series, the latter orient the data collection team towards other people and so on.

Other target populations were directly encountered in the parts of the production series surveyed. However, the main criteria for including the sample of the target population are: living in UFA Pokola and having an income-generating activity in the production series; live in UFA Pokola and act as agricultural labor in the production series and be available to participate in the survey. Thus, 40 people constituted the sampling of local communities and indigenous populations (CLPA) involved in anthropogenic pressure in the production series. The resource persons concerned by the study are essentially the local and administrative authorities of the municipality of Pokola and the villages of the UFA Pokola, the executives and technicians of the Department of Environmental and Social Responsibility of the CIB Olam Agri, but also other community leaders.

The structured individual interviews with the CLPAs concerned by the anthropization of the production series were carried out by means of a questionnaire previously tested during a pre-survey. They were supplemented by direct observations, free discussions and semi-structured interviews with resource persons. The interview guide was the main tool used during individual interviews with resource persons. The GPS points of the anthropization zones were taken with the aim of geolocating these illegal occupations.

C. Data Processing

The secondary data collected during the survey was subject to content analysis in order to extract the information necessary for this study. However, the quantitative data (from the survey questionnaires) were subjected to statistical analysis after entering and processing outliers. The Excel 2013 spreadsheet was used for entering and processing statistical data.

III. RESULTS

A. Knowledge of The Boundaries Between Production and Community Development Series as well as Illegal Activities

More than half (62%) of the local communities and indigenous populations surveyed say they know the limits separating the community development series (CDS) and the production series (SP). On the other hand, some of them (38%) were completely unaware of where the signs limiting the two development series, the community development series and the production series, were placed. The main illegal anthropogenic activities in this series of developments are the establishment of plantations, illegal logging, bushfires and poaching. The best-known illegal activity of local communities and indigenous peoples (CLPA) is the establishment of plantations, the least known remains poaching (Fig. 2). As for the plantations in the production series, among the 66% declaring knowledge of this activity, some admitted having already had to practice it. However, others said they continued to practice it. Those who persisted in this activity said they did so to support their families and send their children to school because they did not have enough financial means.

A. Location of axes under anthropogenic pressure in the production series

The production series is subdivided into forest production units (PFUs). With a very well defined objective, each UFP is intended for the production of lumber and this, for a period starting from 5 to 6 years. Fig. 3 shows the location of the main axes where there are more illegal occupations of CLPAs in the production series (the Pokola-Mboua-Mboua axis, Pokola-PK12, Pokola-Djaka-Loundoungou).

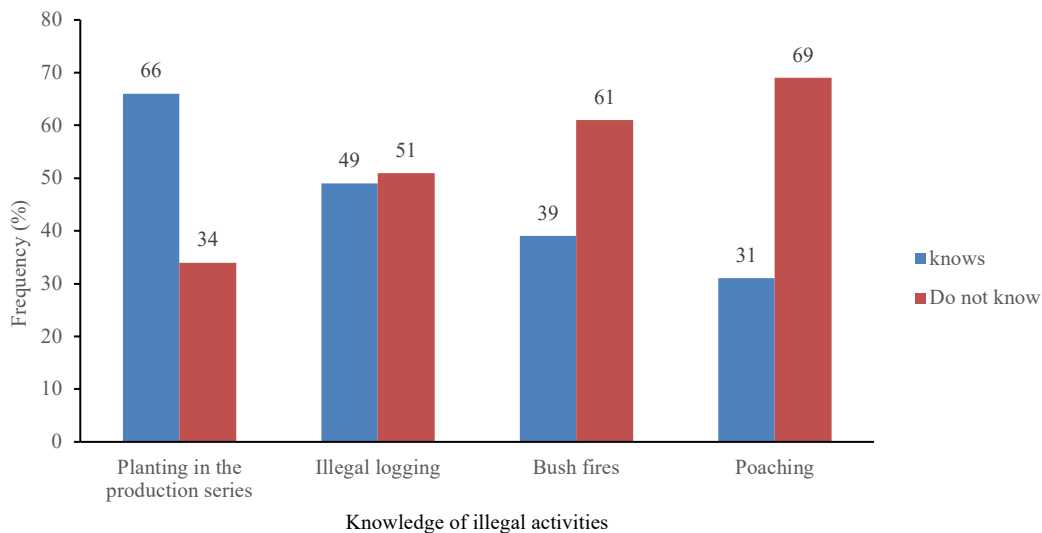


Fig 2. Level of knowledge of illegal activities in the production series.

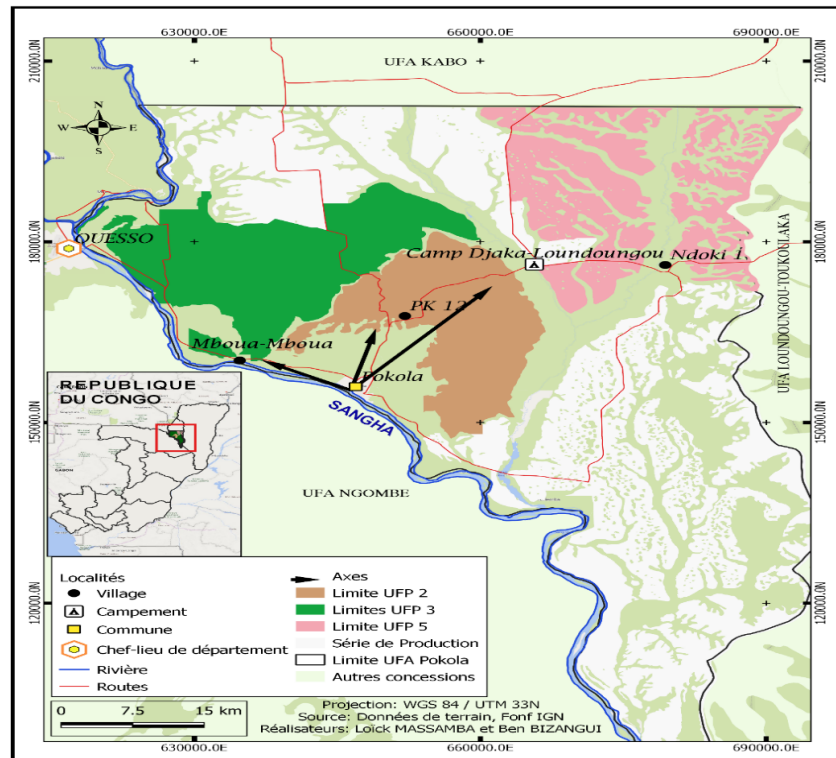


Fig 3. Location of axes under anthropogenic pressure in the production series.

B. Typology and Analysis of Illegal Occupations in The Production Series

Illegal activities in the timber production series of UFA Pokola concern both forest clearing for the establishment of crops (food crops and cash crops), as well as the installation of camps and dwellings. It has been identified 11 realizations of the fields, 07 permanent camps installed in the production series and 05 active dwellings. It is important to note that these illegal activities were closer to the commune of Pokola in the axes Pokola - PK12, Djaka - Loundoungou and Pokola - Mboua-Mboua.

Nearly 11 fields were identified, which made it possible to clear 17.67 ha with an average of one hectare and a maximum of 5.45 ha. The proportion of 64% of the fields is on the axis Pokola - PK12. However, the fields located in the other two axes each represent 18% of all the fields listed in the production series. The speculations most encountered mainly concern banana (*Musa paradisiaca* L.), cassava (*Manihot esculenta* Crantz) and cocoa (*Theobroma cacao* L.). The first two speculations represent almost 69% of the species cultivated in the production areas of the production series; they are sometimes grown in association. Cocoa crops are perennial crops, their establishment in the production series clearly raises the issue of land tenure security and conflict in the event of relocation. Nearly 19% of speculations identified in the fields located in the production series are cocoa trees. Field investigations also showed that 17% of field owners in the production series are indigenous. However, 83% are local populations both of Congolese origin from Brazzaville (58%) and from the Democratic Republic of Congo (25%). The Pokola-Djaka-Loundoungou axis is especially marked by the presence of a camp of more than 100 inhabitants (Table I), created after the development plan. The latter should be called a village. Unfortunately, it is located at the very heart of the production series. Within the Pokola-PK12 axis, a single camp created after the development plan has been identified with nearly 18 inhabitants. However, the Pokola-Mboua-Mboua axis is the one with the largest number of camps, i.e. 5 camps with an estimated population of more than 61 inhabitants.

The majority of local communities and indigenous populations surveyed (85%) acknowledged that they were illegal in carrying out agricultural activities in the production series. However, the others (15%) think that they were not illegal at all. Several reasons are mentioned on this subject by those surveyed (Fig. 4), among which the lack of knowledge of the limits of the community development series, the questioning of the limits of the development series, including that of the production series, but also the difficulty of access to land and the search for productive land. The words of two respondents go in the same direction when they say:

“ At one time, the populations living in the current commune of Pokola and in the villages of the UFA Pokola depended only on the fougou called “Garigombo” returning from a village in Cameroon located on the other bank of the Sangha river. after the Cameroonian village called Socambo. The difficulty of finding staple foods like cassava and bananas was a big problem. Currently, we produce ourselves and we need land and really space (Illegal occupier living in the commune of Pokola)”.

TABLE I: SUMMARY OF OPEN AREAS/CLEARINGS IN THE PRODUCTION SERIES

Axes	Number of clearings	Camps	Inhabitants	Field owners
Pokola-PK12	7	1	18	Indigenous: 2
Pokola-Djaka-Loundoungou	2	1	>100	Bantu: 7
Pokola -Mboua-Mboua	2	5	61	Ground floor: 3

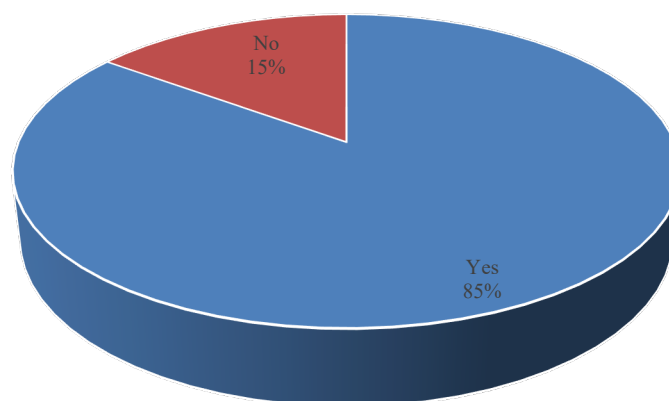


Fig. 4. Distribution of respondents according to their awareness of the practice of illegal activities in the production series.

C. Prospects for Improving The Phenomenon of Anthropogenic Pressure in The Production Series

The phenomenon of anthropogenic pressure and illegal occupation in the UFA production series is due to several causes. The opening of main and secondary roads and skid trails greatly facilitated access to the production series by local communities and indigenous populations. While knowing the importance of the production series and that of community development, the local populations benefit from access to the production series in their favor for the harvesting of NWFPs, agricultural activities, the installation of permanent camps and dwellings in the said series. These anthropogenic activities (agriculture, installation of camps, etc.) are currently carried out on the outskirts of the timber production series, close to the municipality of Pokola. Economic, demographic and land management factors are therefore the main determinants of the phenomenon of anthropogenic pressure on the production series. The difficult access to land within the commune of Pokola for a category of local communities and indigenous populations also reinforces this phenomenon. The testimony of an illicit occupant of the production series, originally from the DRC, goes in the same direction when he affirms:

“I came to Congo Brazzaville to look for money. My wife and I had judged to stay in this area of Pokola. When we saw the empty spaces occupied by the natives, we took advantage of settling in these abandoned spaces and set up our banana fields to supply the town of Pokola”.

In addition, the overlap between the applicable texts for the management of the forest, and the lack of openness of the access roads to the zones reserved for agricultural activities in the SDC are among the causes at the origin of this phenomenon.

However, the demographic and spatial growth of the municipality of Pokola risks aggravating this phenomenon. It should be noted that the installation of new arrivals on the left side of the Sangha River and along the Pokola-Ouessou access road is a risk factor for anthropogenic pressure in the production series. This ambivalent situation pleads in favor of rational management of the land within the commune of Pokola and of the whole of the SDC. In addition, human activities in the production series have negative impacts on the growth of future species. The agricultural operations practiced (burning, clearing, felling of trees, etc.) by local communities and indigenous populations do not comply with reduced impact logging standards (RIFL), they contribute to deforestation. Fig. 5 presents a summary of the main causes and consequences of this phenomenon of anthropogenic pressure in the UFA Pokola production series.

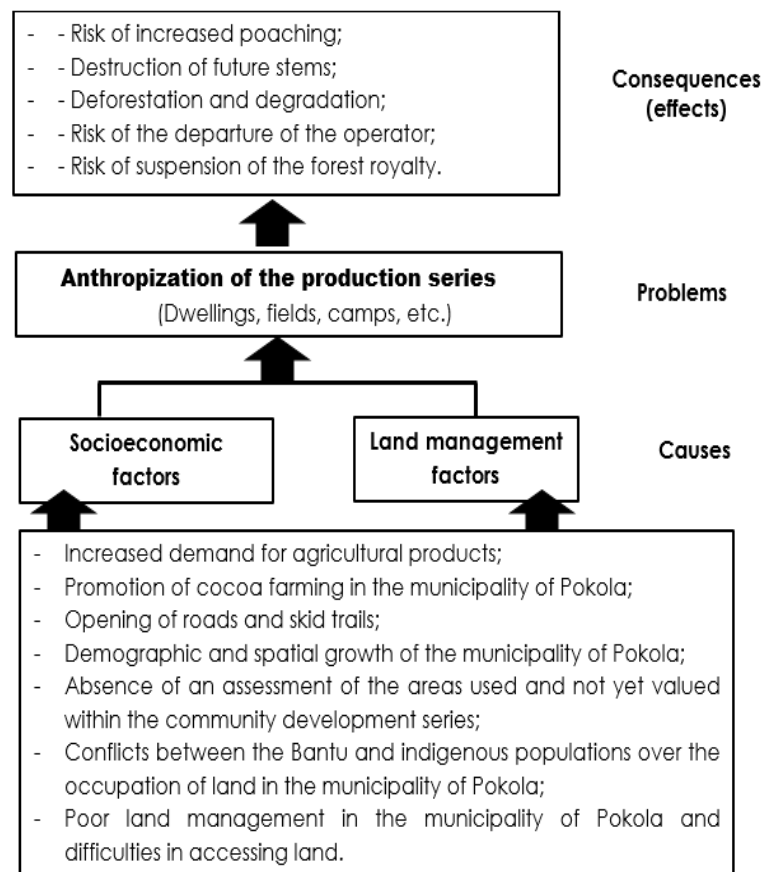


Fig. 5. Problem tree of the anthropogenic pressure phenomenon of the production series.

IV. DISCUSSION

The purpose of this study was to analyze the causes of illegal occupations in the UFA Pokola production series. This phenomenon, currently linked to the demographic and spatial growth of the municipality of Pokola, is a potential major conflict between the stakeholders (the concessionaire, the CLPAs, etc.). The CLPAs, through these illegal occupations in general and particularly through slash-and-burn agriculture practices, are at the origin of the deforestation of the production series and the loss of forest species. This result corroborates with that of Karsenty and Vermeulen (2016) who state that deforestation is not only associated with the presence of forest concessions. The roads and tracks created by logging constitute potential access routes for farmers and facilitate the marketing of their products. It appears from this study that the local populations take advantage of the openings of the main and secondary roads to access the series of timber production to practice agricultural activities and set up camps and dwellings. It is in this same sense that Karsenty and Vermeulen (2016) assert that land pressure in forest concessions is the result of the combination of an increase in population density, specific agricultural practices and forest tracks. The latter must be closed by the company after the end of the exploitation cycle, which is generally two years for a cutting area.

Law No. 33-2020 on the forest code in the Republic of Congo specifies in article 78, the delimitation of the forest management unit into management series with well-defined objectives for each of them. The UFA Pokola production series, which has the general objective of the rational production of timber, is now, despite everything, open to illegal occupation. In the study area, clearing, non-selective felling and the practice of burning are land preparation operations that have a negative impact on the environment. Thus in Kerala, the various plantations and uncontrolled clearings were spreading while the Department of Forests gave concessions to industries for the extraction of bamboo and timber without limit of quantities (Dejouhanet, 2007).

An analysis of illegal activities (illegal logging, bush fires, plantations in the production series) made during this study made it possible to estimate the level of knowledge of illegal activities by the populations at 66%. Of the 66% who said they were aware of this activity (agriculture in the production series), some respondents said they had already had to practice them and that others continued to practice this type of activity in the production series. Those who persisted in this activity said they did it to meet the needs of their families and to pay for their children's schooling, because they did not have enough financial means. Despite all this pressure, agricultural production in the FMU, especially cassava, is unable to meet demand.

This presence of illegal CLPA occupations in the production series seems to show poor land management in the SDC and the weakness of the instrument for financing CLPA micro-projects, the Local Development Fund (LDF). The latter is a participatory management tool, it represents an innovative model of local development mechanism, integrating the different levels of planning and execution, from the local village community to the departmental authorities (Mbété *et al.*, 2021). During the study, it was found on the question of the limits of the Community Development Series (CDS) that 62% of the local populations were well aware of where the limits were located between the CDS and the Production Series (SP). . On the other hand, 38% of them were completely unaware of where the limits were between the SDC and the production series. Thus, Nguinguiri (1999) affirms that the modes of appropriate management would be consequently those which obey the concepts of democratization at the base, political liberalization, collective responsibility and that the participative management would be a necessity. The success of the participation of local populations in the management of community forests remains linked to the capacity and above all to the will to reform on the part of forest administrations and society, which do not yet seem ready to share the power of control and decision on the management of forest resources (Granier, 2006).

V. CONCLUSION

This study consisted in analyzing the anthropogenic pressure of the CLPAs in the UFA Pokola production series. It was necessary to examine the point of view of the local CLPAs in order to detect the reasons for illegal occupations in the production series. It emerges from the study that the ignorance of the limits is not necessarily at the origin of the anthropization, 62% of inquired affirm to know well the limits separating the series of production and the SDC. However, the study confirms that the spatial and demographic growth of the municipality of Pokola as well as the difficulty of access to land in the SDC are at the origin of the anthropogenic pressure in the production series. Human pressure in the production series obeys an economic and social logic. The illicit activities identified in the production series concern agricultural activities, the installation of camps and the presence of a few dwellings. The latter belong to the CLPAs involved in hunting, gathering and agricultural activities (banana, cocoa, etc.). Better land management in the SDC in general and particularly in the commune of Pokola would make it possible to attenuate this phenomenon of anthropization of the series of production.

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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

REFERENCES

- Anonymous (2007). *Development plan of the Pokola Forestry Development Unit (UFA) (2007-2035)*. Congolese Industrial Wood (CIB), Terea, GTZ, FFEM, French Development Agency Group, ITTO, 382.
- Anonymous (2020). *Usage rights and community development series (information sheet on the provisions of law n°33 of July 08, 2020 on the forest code in the Republic of Congo)*, Junior Legal Counter and Clientearth, London, 7.
- Dejouhanet, L. (2007). *Non-Timber Forest Products And The Management Of The Kerala Forest: Rights Of Use And Right Of Control*, Christoph Eberhard (Eds), In Land And Environmental Issues, Afro-Indian Dialogues, French Institute of Pondicherry, pp. 407-440.
- FAO. (2010). *Global Forest Resources Assessment*. Rome: Green Ink. Retrieved from: <http://www.fao.org/3/i1757f/i1757f.pdf>.
- Granier, L. (2006). *Local conventions for the management of natural resources and the environment. Legality and consistency in Senegalese law*. IUCN, Gland, Switzerland and Cambridge, UK, p. 44.
- Karsenty, A., & Vermeulen, C. (2016). *Towards Concessions 2.0 articulating inclusive and exclusive management in production forests in Central Africa*. Gérard Buttoud and Jean-Claude Nguinguiri (Eds), In Inclusive Forest Management In Central Africa, From Participation To Power Sharing. pp. 206-228.
- Law n°33-2020 of July 08, 2020 on the forest code. Official Gazette of the Republic of Congo. Special edition, 62nd year, n°4, 2-26.
- Mbete, P., Bakouetila, G. F. M., Leckoundzou, A., Obimbola, C. R. G., Goma, A.R., Boukoulou, H. (2021). Analysis of the functioning of the Local Development Fund (FDL) from the community development series of Pokola (Congo), *International Journal of Environment, Agriculture and Biotechnology*, 6(3): 112-122.
- N'zala, D. (2002). Conservation and sustainable management of tropical rainforest ecosystems in Central Africa. Example of the concessions of Pokola – Kabo - Loundoungou, Congo. *FAO study*, 21.
- Nguinguiri, J. C. (1999). *Participatory approaches in the management of forest ecosystems in Central Africa; review of existing initiatives*. Occasional document n°23. Center for International Forestry Research (CIFOR), Bogor, Indonesia, 38.