

Timber trade in the eastern Democratic Republic of the Congo (DRC): effectiveness of timber parks in tackling tax frauds

S. FERRARI and P.O. CERUTTI

Center for International Forestry Research / World Agroforestry (CIFOR-ICRAF), Kisangani, DRC

Email: p.cerutti@cifor-icraf.org, s.ferrari@cifor-icraf.org

HIGHLIGHTS

- The DRC Government has adopted and run an innovative ‘timber park’ model to check timber trade and exports in the eastern part of the country.
- The ‘timber park’ was able to detect various potentially egregious forms of illegalities, but also learn from observed illegalities, adapt its procedures, and improve its performance over time.
- In the case of transiting timber, which is sealed at origin and not checked at the park, it was possible to detect the very worrying trend that 100% of export declarations mention only one, and the same tree species.
- The park staff were able to detect the clear mismatch between what was declared as *Mammea africana* and belonged instead to the genus *Azelia*, commercial name doussié, possibly *A. bipindensis*, one of the most valuable species (in terms of taxation) and also part of the country’s most threatened species, recently listed in Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Many species of the genus *Entandrophragma spp* (sipo, kosipo, sapelli, tiama) were observed by the park staff but never declared in transport waybills. More laboratory analyses are recommended to verify the exported species.

SUMMARY

The Democratic Republic of the Congo (DRC) shares borders with nine countries and has around 150 million hectares of tropical moist forests. A moratorium on logging titles has been in place since 2002 and infrastructure is very poor. The country plans to lift the moratorium and invest in infrastructure as part of the broader East-African road and railway networks. We present a case-study conducted for thirty months (2020–2022) on timber trade and export at the first ‘timber park’ established on the eastern border. Multiple forms of potentially illegal timber trade were detected. In the case of transiting timber, results indicate that 100% of export declarations mention only one, and the same tree species. There also exist several mismatches between declared vs actually exported species (e.g. *Mammea africana* instead of genus *Azelia*, recently listed in Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)). We estimate the potential financial losses for the DRC Government and discuss possible improvements. The model’s extension to major border crossings could contribute to both sectoral improvements and better environmental policies. Yet results also indicate that the model’s replication, sustainability and effectiveness can only occur and be maintained if interest and political support by provincial governments and their field staff remain strong.

Keywords: Democratic Republic of the Congo, DRC, illegal timber trade, timber exports, CITES

Commerce du bois dans l’est de La République Démocratique du Congo (RDC): efficacité des parcs à bois dans la lutte contre la fraude fiscale

S. FERRARI et P.O. CERUTTI

La République démocratique du Congo (RDC) partage ses frontières avec neuf pays et compte environ 150 millions d’hectares de forêts tropicales humides. Un moratoire sur les titres d’exploitation forestière est en place depuis 2002 et le réseau routier est faible. Le pays envisage de lever le moratoire et d’investir dans la construction des réseaux routiers et ferroviaires, pour une plus grande intégration aussi avec les marchés régionaux. Nous présentons une étude de cas menée pendant trente mois (2020–2022) sur le commerce et l’exportation du bois dans le premier parc à bois établi à la frontière orientale. De multiples formes de commerce potentiellement illégal du bois ont été détectées. Dans le cas du bois en transit, les résultats indiquent que 100% des déclarations d’exportation ne mentionnent qu’une seule et même essence d’arbre. Il existe également plusieurs discordances entre les espèces déclarées et les espèces effectivement exportées (par exemple, *Mammea africana* au lieu du genre *Azelia*, récemment inscrit à l’annexe II de la convention sur le commerce international des espèces de faune et de flore sauvages menacées d’extinction (CITES). Nous estimons les pertes financières potentielles pour le gouvernement de la RDC et discutons des améliorations possibles. L’extension du modèle du parc à bois aux nombreux points de passage des frontières pourrait contribuer à la fois à des

améliorations sectorielles et à de meilleures politiques environnementales. Pourtant, les résultats indiquent également que la reproduction, la durabilité et l'efficacité du modèle ne peuvent se produire et être maintenues que si l'intérêt et le soutien politique des gouvernements provinciaux et de leur personnel sur le terrain demeurent forts.

Comercio de madera en La República Democrática del este del Congo (RDC): eficacia de los parques de madera en la lucha contra el fraude fiscal

S. FERRARI y P.O. CERUTTI

La República Democrática del Congo (RDC) comparte fronteras con nueve países y tiene alrededor de 150 millones de hectáreas de bosques húmedos tropicales. Desde 2002 existe una moratoria sobre los títulos de tala y la infraestructura es muy deficiente. El país planea levantar la moratoria e invertir en infraestructura como parte de las redes viales y ferroviarias más amplias de África Oriental. Presentamos un estudio de caso realizado durante treinta meses (2020–2022) sobre el comercio y la exportación de madera en el primer “parque maderero” establecido en la frontera oriental. Se detectaron múltiples formas de comercio de madera potencialmente ilegal. En el caso de la madera en tránsito, los resultados indican que el 100% de las declaraciones de exportación mencionan una sola y misma especie arbórea. También existen varios desajustes entre las especies declaradas y las realmente exportadas (por ejemplo, *Mammea africana* en lugar del género *Afzelia*, incluida recientemente en el Anexo II de la Convención sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestres (CITES). Estimamos las pérdidas financieras potenciales para el Gobierno de la RDC y discutimos posibles mejoras. La extensión del modelo a los principales cruces fronterizos podría contribuir tanto a mejoras sectoriales como a mejores políticas ambientales. Sin embargo, los resultados también indican que la replicación, la sostenibilidad y la eficacia del modelo solo pueden ocurrir y mantenerse si el interés y el apoyo político de los gobiernos provinciales y su personal de campo siguen siendo fuertes.

INTRODUCTION

The Congo Basin hosts about 200 million ha of tropical moist forests (Vancutsem *et al.* 2021), the second largest continuous tract after the Amazon. More than 60% of these forests fall within the Democratic Republic of Congo (DRC), extending across 85% of the country's land area (Eba'a Atyi *et al.* 2021). Deforestation and forest degradation in the DRC are overwhelmingly shaped by a fast-growing population reliant on shifting cultivation for food, charcoal making and selective timber harvesting (Moonen *et al.* 2016, Molinario *et al.* 2020, Zhuravleva *et al.* 2013, Vancutsem *et al.* 2021).

All three sectors, namely agriculture, energy, and forestry in the DRC have received increased political attention in recent years because of the role they could potentially play in the development of an improved national economy and in the implementation of the country's climate policies and pledges (MEDD 2021, CAFI 2021). Yet while agriculture and energy come generally under scrutiny in terms of how they could be improved, timber harvesting still elicits fierce debates about whether it should occur at all, as illustrated by the recent discussions in the national and international media about the lifting of the 20-years moratorium on logging titles (e.g. Kanashiro Uehara *et al.* 2023, Greenfield and Harvey 2022, Kabemba 2021). Within those debates, however, the focus remains almost entirely on industrial timber harvesting conducted in large-scale, export-oriented logging concessions. By contrast, timber harvesting conducted outside logging concessions, and generating both national and international timber trade – the focus of this paper – is rarely discussed.

There exist both technical and political reasons for such neglect. Technically, unless extensive fieldwork is conducted in parallel to the use of satellite technology, it remains very difficult to quantify or to differentiate from other similar

activities, such as charcoal making (e.g. Tyukavina *et al.* 2018). Politically, it is commonly framed within the alternative definitions of ‘small-scale’ or ‘artisanal’ logging and mixed with various other activities under the banner of the informal economy. There are at least two major problems with this situation, worth noting upfront because they demarcate the DRC from all other countries of the Congo Basin.

First, while the DRC shares borders with nine countries, when it comes to timber harvesting the country can arguably be split into three very broad areas. The West, with the port of Matadi used as a gateway to the world for (mostly) raw logs harvested in industrial logging concessions, largely located in the west of the country. The South, with various intersecting roads, through which timber harvested in the Miombo dry forests can pass. The East, with various intersecting roads, through which passes most of the timber harvested in tropical forests which lie north and east of Kisangani, the capital of Tshopo Province. The latter zone has no industrial logging concessions (bar one in the far east of the country). As such, almost all production comes from selective harvesting conducted outside logging concessions (Lescuyer *et al.* 2014).

Results on official documentation used in this assessment corroborate past analyses indicating that it is also largely conducted outside the legal framework (Chevallier and du Preez 2012a, Lukumbuzya and Sianga 2017, WWF 2012). Hence, a debate focussed on logging concessions is largely a debate on the western part of the country, with an imaginary line set in Kisangani, the furthest point from where timber can be floated down the Congo River before it reaches the capital, Kinshasa 1 700 kilometres downriver, before export occurs via the Atlantic Ocean.

The eastern (and southern) part of the country, and the timber harvested and exported from its borders, is absent from this debate. At the national level, while official records

show industrial concessions' production and exports of about 300 000 m³ per annum over the last decade, barely any other timber production is recorded at all. Yet available assessments estimate production outside logging concessions (with or without legal logging titles) at about ten times that of the industrial one (Lescuyer *et al.* 2014), part of which is exported via the eastern borders (Chevallier and du Preez 2012b, WWF 2012, Lukumbuzya and Sianga 2017).

Second, such debate is blind to the various business models that timber harvesting, trade, and export can assume in the eastern part of the country. It allows everyone to hide behind the uniform layer of the informal economy, whether one is a local artisan cutting trees to build their own house or a local school, or an unscrupulous medium- to large-scale enterprise with enough financial resources to cover the upfront costs associated with logging, trading and bribing its way through customs.

On both counts, such scant knowledge and attention translate into limited chances for improved and more sustainable environmental policies and a chronic difficulty to adopt corrective measures and sanction malpractice, while illegal logging and timber trade, and DRC's revenue losses, can continue unabated. Scant knowledge on lost revenues also means that the power of fair forest and environmental taxation systems cannot be used to its full potential. In addition to the more classic understanding of taxes as a way for the State to finance its development, they can indeed become instruments working against excessive exploitation of natural resources, or to be used as compensation for externalities derived from such exploitation (Karsenty 2019, Hansen & Lund 2018, Karsenty 2010).

To improve the situation, the DRC government has recently adopted a series of regulations for the creation, implementation and management of 'timber parks' at various border crossings, aimed at supporting the country's fight against illegal logging and timber trade, and commercial frauds (République Démocratique du Congo 2018, République Démocratique du Congo 2017).

This paper presents a case study on timber trade and export at a major eastern border of the DRC, where one of the first timber parks – and so far the only operational one – has been created by the DRC government to monitor timber exports and revenue collection.

The research leading to this paper was a joint effort between the country's government and civil society, coordinated by the authors. The objective of this case-study was to assess the strengths and weaknesses of the current data recording system adopted by the park by determining the discrepancies between data declared by timber operators and various government agencies, and data which underwent physical verification at the park.

More broadly, the results of this study support recent (national and provincial) government reforms which aim to streamline recording and monitoring systems and crack down on illegal timber exports and unpaid revenues, hence contributing to the country's broader pledges on reducing deforestation and forest degradation and increase revenues from the exploitation of its natural resources.

Results highlight that the 'timber park' model – mandated by the central government, supervised by the provincial government, and managed in coordination with civil society and the private sector – was able to detect various potential forms of illegal timber harvesting and trade, learn from observed illegalities, adapt its procedures, and improve over time. Its extension to major border crossings could contribute to both sectoral improvements and better environmental policies. Yet, results also clearly indicate that replication, sustainability and effectiveness of the model can only be as good as the interest and political clout shown by provincial governments and their field staff. Importantly, this must be a concern of provinces both at the production and at the export sites, to tackle various issues highlighted both upstream and downstream along the timber value chain.

Results also have implications beyond the DRC, as they directly speak to a regional context which has evolved even during the study period. For example, the African Continental Free Trade Area (AfCFTA) formally started operating on 1 January 2021, while the DRC's acceded to the East African Community (EAC) in summer 2022. The DRC's eastern (and northeastern) border is thus now shared with nearly all other EAC members (South Sudan, Uganda, Rwanda, Burundi and Tanzania). Although the political attention on exported commodities has historically been on minerals, these changes will also have direct repercussions on the export of other commodities such as timber.

The paper is organised as follows: the next section provides a brief description of the DRC's situation with timber production and exports in its eastern part, as well as useful regulations framing timber harvesting and exports. The methodology applied to this case study is then explained. The results follow, before the final section discusses them and concludes with some recommendations.

TIMBER PRODUCTION AND EXPORT IN EASTERN DRC: A BRIEF OVERVIEW

Broadly speaking, the DRC regulations allow two different logging practices: industrial and artisanal timber harvesting (République Démocratique du Congo 2016). The former can take place inside industrial concessions. Artisanal harvesting is instead authorised in customary areas, forest concessions of local communities, or artisanal forest units, although none of the latter has been created so far (Semeki *et al.* 2021).

A moratorium on the attribution of new industrial concessions has been in place since 2002, contributing to the relatively small importance of the timber sector to the formal national economy, at around 1 percent (World Bank 2013). Although the moratorium has not always been consistently respected (Photo Ngumba *et al.* 2022), it has – in addition to the country's very poor transport infrastructure – undoubtedly limited the number of logging concessions currently active in the country. Industrially produced timber is mainly exported to the international market as raw logs, via port facilities in the country's west where industrial concessions are concentrated; the Congo River playing the role of a highway used to float logs.

Conversely, timber from the country's east is largely produced outside logging concessions – only one concession is present in the area, with limited production capacity (Chevallier and du Preez 2012b) – and exported to neighbouring countries such as Rwanda, Burundi, South-Sudan, Tanzania and Uganda, which is both a market and a transit destination to Kenya and its port (WWF 2012, Tsanga *et al.* 2020). Hence – the Congo River not being an option – timber must be transported for hundreds of kilometres over very harsh road conditions, largely in the form of sawnwood.

Wood-balancing models, comparing officially declared timber exports from the DRC with timber imports of neighbouring countries, do not provide much clarity about what is actually transported across the borders, as DRC declarations in international databases (e.g. UN-COMTRADE) are generally incomplete, as are those of neighbouring countries (Lukumbuzya and Sianga 2017, Kambu *et al.* 2021). Existing estimates for timber export through the eastern border vary between 65 000 m³ and 200 000 m³ of sawnwood per year, depending on the methods used and the year of recording (Cerutti *et al.* 2017, Lescuyer *et al.* 2014, WWF 2012).

After noticing numerous irregularities in timber exports (customs fraud and tax evasion) in defiance of existing regulations, in 2017 the National Minister of the Environment (*Ministère de l'Environnement et du Développement Durable, MEDD*) issued a circular note for provincial Governors (République Démocratique du Congo 2017), mandating the creation of timber parks (*parc à bois*) in all the DRC's accessible border points. The note mandates timber destined for export to be unloaded in the timber park for inspection (e.g. quantity and quality control, and verification of payments), in addition to the stamping of timber leaving the country. The first operational timber park was created in 2018 and, until 2022, it remained the only active one in eastern DRC.

Management of the timber parks is ensured by a management committee (CoGe for *Comité de Gestion*). The provincial minister in charge of environment designates members for this CoGe, who come from three institutions: (i) the National Forest Fund (FFN), (ii) the environment service, and (iii) the association of small-scale loggers representing the private sector. Composed of six members (two from each institution), the CoGe has five major responsibilities: (i) to collect statistics, (ii) to maintain and ensure the security of timber unloaded at the park, (iii) to maintain and improve site facilities, (iv) to acquire and manage park equipment, and (v) to regulate the handling of timber and other materials on site.

METHODOLOGY

The work leading to this case study was conducted over two and half years (2020–2022). It included a preparation phase with test data collected to inform and refine the methodology, a data collection phase (Jan–Dec 2021), and a verification, dissemination, and discussion phase. All phases were discussed, prepared, carried out and improved in collaboration with the Office of the Governor as well as relevant provincial

ministries, and institutions in charge of the timber park. Hence, this case study is as much a technical effort to shed light on timber fluxes from eastern DRC, as it is an experiment in the improved governance of the DRC timber value chain.

As a preparatory step to the fieldwork, i.e. before starting data collection, the park personnel received ad-hoc training on timber identification. The training course occurred at the wood anatomy lab in Yangambi, DRC in October 2020, in collaboration with a team of experts prepared by staff of the AfricaMuseum in Belgium. The training focused on the main commercial species such as *Pericopsis elata*, *Milicia excelsa*, *Entandrophragma spp.*, *Khaya anthotheca*, *Pterocarpus soyauxii*, *Gilbertiodendron dewevreii* and *Mammea africana*. Macroscopical identification of different wooden species was performed by using simple tools like magnifying glass and scalpel which can be easily adopted in real-life conditions of Custom officials, e.g. at the timber check points at the border posts.

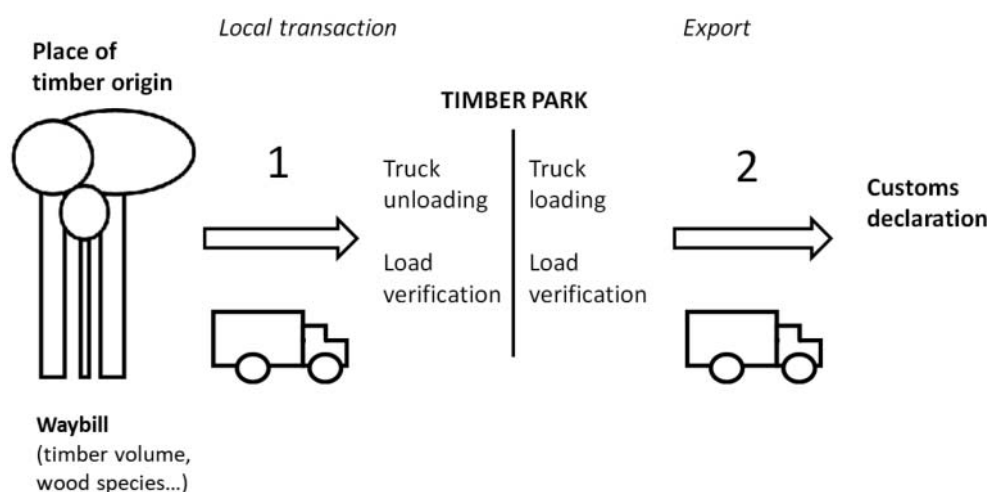
Because actual verification of timber volumes and wood species was possible at the park, the first objective was to check whether discrepancies exist in the data declared by timber operators to various government agencies, from the point of harvest until timber reaches the export park. Two verifications were possible (FIGURE 1).

A first verification (i.e. 'local transaction' in FIGURE 1) was made between what is declared by the loggers on the transport waybill, and what is actually found at the park. The waybill is approved in the province of origin, by the local environmental administration where harvesting occurs, and must always travel with the goods from the place of production to the place of unloading (at the park). A second verification (i.e. 'export' in FIGURE 1) was then made, between what is loaded on trucks at the park, and what is declared to customs on the official customs declaration form, on which export taxes are calculated.

A coding system was developed, applied through standard spreadsheets software, and used at the park and in the back-to-office analyses. The coding system was collaboratively elaborated by the authors and the local partners, and later deployed at the timber park by trained members of the park. The latter were regularly monitored during the collecting period to guarantee the correct compilation of the spreadsheet. Recorded data were then analysed monthly by the team, leading to a continuous follow-up of the discrepancies discussed below.

The coding system was built to represent three possible options: (A) timber unloaded at the park (in this case, timber comes from forest areas inside the country, generally from the provinces of Tshopo, Ituri and North Kivu); (B) timber loaded at the park for export; (C) timber transiting through the park to neighbouring countries (this is the case when all customs paperwork has already been completed and export taxes have been paid in the provinces where the timber originated, therefore timber is generally sealed and not required to be unloaded for inspection). Each of these options entails various steps, detailed in the paragraphs below.

FIGURE 1 Illustration of timber fluxes from production to export points



Timber unloaded at the park

Sawnwood coming from forest areas is unloaded at the park to be checked by various administrative services before export. The arrival date of the truck at the park is recorded, followed by (i) the information reported on the transport waybill, and verified (or not) by the park staff; (ii) the amounts and types of taxes paid, as recorded on the tax receipts travelling with the timber; and (iii) the amounts of timber as estimated by the park staff after inspection of the truck. In theory, the information reported on the transport waybill is checked and validated by the environmental supervisor of the territory where timber is harvested and stored before transport. Taxes are then calculated based on that information (e.g. timber species and volumes). When a load arrives at the park and the transport waybill is presented, the following data are recorded: (i) transport waybill number, (ii) name of the logger, (iii) the number of the logging permit (or the relative receipt), (iii) wood species, and (iv) timber quantity in m^3 . Verification of the above information occurs during unloading, and timber species and the number of planks is recorded.

While counting the number of planks is a relatively easy task, conversion of this to m^3 is not if one follows outdated or incorrect protocols. This is the case at the border crossing, where it was usual to convert 14 planks to $1 m^3$. As discussed in the results section, this underestimates volumes and taxes. In fact, the standard dimensions of exported planks are 0.06 m (thickness) x 0.3 m (width) x 5.6 m (length) for the planks called “ring two” and 0.12 m x 0.3 m x 2.8 m for the planks called “ring four” which have exactly the same volume of the “ring two”, with double thickness and half length. Hence 14 planks of such dimensions result in $1.4 m^3$ and not $1 m^3$.

This finding led to the Provincial Governor to recommend at the end of 2022 a change in the formula applied (so that 12 planks should have been considered to be $1 m^3$) as part of this case study’s learning process. While the new conversion formula is awaiting implementation, for the calculation of the real volumes estimated in this study we adopted the

ratio 14 planks to $1.3 m^3$ instead of to $1.4 m^3$. This is justified because – given the bad quality of some planks especially at their margins – the actual usable length of the plank can sometimes be reduced by the final client.

For the calculation of the main local taxes due, we considered: (i) stumpage fee (from USD 5 to USD 15.5 per m^3 according to wooden species and the province of origin); (ii) local OCC (USD 10/ m^3); (iii) province exit tax (USD 12.5 and USD 20 for Ituri and Tshopo province respectively); (iv) *chefferie* (chiefdom territory) exit tax, (a minimum of CDF 5 000, or about USD 2.5 per m^3 was used to calculate this, as it is impossible to know the value of each *chefferie*’s tax, since each decides based on the perceived abundance of its own forest resource). If receipts are missing, the value recorded is calculated based on data reported on the transport waybill.

Together, these recorded data enable calculation of the gaps, in terms of species, quantity, and fiscality between what is declared and paid at the local level, and what is effectively found at the park during unloading.

Timber loaded at the park

Unloaded timber is then prepared for export and loaded onto trucks in quantities and specifications indicated by the exporting companies. This procedure is conducted under the scrutiny of the park staff, with the following data being recorded: (i) loading date; (ii) exporter name; (iii) truck plate number; and (iv) species name and volume, in number of planks to be converted to cubic meters, according to the local protocol (14 planks to $1 m^3$, now updated to 14 planks to $1.3 m^3$).

These data allow for calculation of what export taxes are due, as well as enable comparison with the data declared to customs, and the amount of export taxes actually paid. Export taxes are automatically calculated by the customs office, based on the declared wood species and quantity (m^3). The values for each tax and fee are calculated by the system as a percentage of the ‘statistical value’ (with the exception of the ‘land logistics fee’, TABLE 1), i.e. the market timber value per species, multiplied by the m^3 declared.

TABLE 1 Percentage values for the different taxes and services to be paid for timber exportation. Some taxes are calculated per wood species (items); others for the whole load (see Column 3)

1. Tax/service delivery classification	2. % of the statistical value	3. Paid for each species	4. Note
Reforestation tax (REB)	1.455	Yes	REB to support the implementation of the <i>National Forest Fund's</i> annual plans for restoring forest on the national territory
Export customs duty (DDE)	5	No	Customs duty
Land logistics fee (RLS)	Constant value (CDF 260 000–270 000 or USD 125–130)	No	RLS to improve the transport infrastructure, in particular the railway.
Commission OGEFREM (COG)	0.457	Yes	Duty for OGEFREM (<i>Multimodal Freight Management Office</i>) which has the mission of improving the different transport services of goods
Remuneration on Commission OGEFREM (RCO)	0.025	No	See above
Follow-up committee OGEFREM-DGDA (CSO)	0.018	No	See above
Informatic licence at export (RIE)	0.25	Yes	Duty on informatic systems used at customs
ETD duty	1	Yes	Duty for the Decentralized Territorial Entities
Congolese Control Office (CCO)	0.85	Yes	Payment for CCO services. CCO has the task of assuring regular commercial transactions.

Timber transiting through the park

Transiting timber is not inspected at the park, on the assumption that all timber export formalities should have already completed and all taxes paid in the provinces of origin (i.e. mainly Ituri and Tshopo). Transiting trucks are sealed and pass through the park without being unloaded or checked. Timber park staff nonetheless recorded the following information: (i) date of transit, (ii) exporter name, (iii) type of vehicle (see TABLE 2), (iv) truck plate number, and (v) the unique number on the customs declaration (if a copy is given to the park staff, which is usually the case). When this happens, park staff can match the unique customs number to the truck in transit, since trucks arrive at the park with the customs declaration prepared and delivered in the provinces of origin.

As park staff cannot check truck contents, for the purpose of this case study an estimation method was adopted, based on samples from inspected trucks, linking the volumes transported to the types and models of trucks and the average number of transported planks (TABLE 2).

TABLE 2 Wood planks, per type of truck crossing the border

Type of truck	Average number of planks
Long semi-trailer	1 000–1 200
Medium semi-trailer	800
Trailer	1 200
Truck with 10 wheels	450

Estimated volumes were then used to calculate due taxes. As stated, taxes are based on the species of timber, which cannot be checked if trucks are sealed. However, a single species is only always mentioned on every custom declaration, *Khaya anthotheca*. As such, due taxes were estimated as if all timber transiting through the park was of the same species. This, as explained in the next section, is very likely to result in an underestimation of due taxes, because it is very unlikely that just this one species is harvested and exported.

As a general rule applied in all estimations made in this study, i.e. in the few cases where actual volumes or financial values could not be verified at the park, it is worth mentioning that we opted for a conservative approach to discrepancies. This was done in order to avoid overestimating losses. Between arrival at the timber park, unloading, loading, transit, and export, it is thus possible to conduct various triangulations on the available (or estimated) information, which is what has led to the results detailed in the next section.

RESULTS

The results of the analyses conducted at each stage of the export procedure are described below, followed by a general overview of the findings.

Timber unloaded at the park

Over 12 months in 2021 250 unloading operations were recorded at the park. The vast majority (93%) of the timber bears no trace of an authorized logging permit or receipt number for a permit. Almost all declarations (97%) list one

species of timber, the remaining 3% list two species. This results in a total of 277 declarations of species: *Khaya anthoteca* (commercial name acajou d’Afrique) 76%; *Mammea africana* (oboto) 17%; *Milicia excelsa* (iroko) 3%; *Cordia africana* (cordia) 2% and others (*Guarea spp* and *Alstonia spp*) 2%. The total recorded volume unloaded was 2 253 m³, the declared origins of which were the provinces of North Kivu (68%), Ituri (28%), Tshopo (3%) and Haut-Uélé (1%).

Upon verification of the unloaded timber, the team had several doubts about some of the declared species. Time and resources were lacking to send all declared species for inspection by a wood laboratory, but the decision was taken to send the one seeming to show the clearest example of dubious declaration, *Mammea africana*, a timber locally called ‘bulungu’. Two samples were sent first to the Yangambi Wood Anatomy Lab and then to the AfricaMuseum in Belgium for double check. Results indicate that they belonged in fact to the genus *Afzelia*, possibly *A. bipindensis* (commercial name doussié, which has the highest rate of taxation compared to all other wood species; *Mammea africana* belongs to ‘Other species’ and carries the lowest taxation rate).

Along the same line of enquiry, many so-called ‘redwood’ species of the genus *Entandrophragma spp* (sipo, kosipo, sapelli, tiama) were observed by the park team; these species were never declared in transport waybills. This remains a speculative result; more laboratory analyses are recommended to verify the exported species, because misdeclaration of species seems common among exporters.

The total volume estimated upon unloading timber was about 4 031 m³, indicating volumetric under-declarations of about 44% when compared to transport waybills (FIGURE 2).

This discrepancy is conservative and based on local protocols – used by both traders and government officials – which specify to use the ratio of 14 planks of timber to 1 m³ (henceforth 14:1). In fact, the standard dimension of planks (locally

called ‘ring four’ and measured during fieldwork) result in a more plausible ratio of 14 planks to 1.3 m³ (henceforth 14:1.3).¹ This results in the actual unloaded volume of about 5 241 m³, highlighting an average discrepancy with official declarations of about 57%.

When assessing the four different taxes (stumpage tax, provincial exit tax, *chefferie* exit tax, and payment of the Congolese Control Office’s service), it is seen that proof of payment is often missing (TABLE 3); with the CCO’s service, for example, proof of payment is only present in 21% of cases.

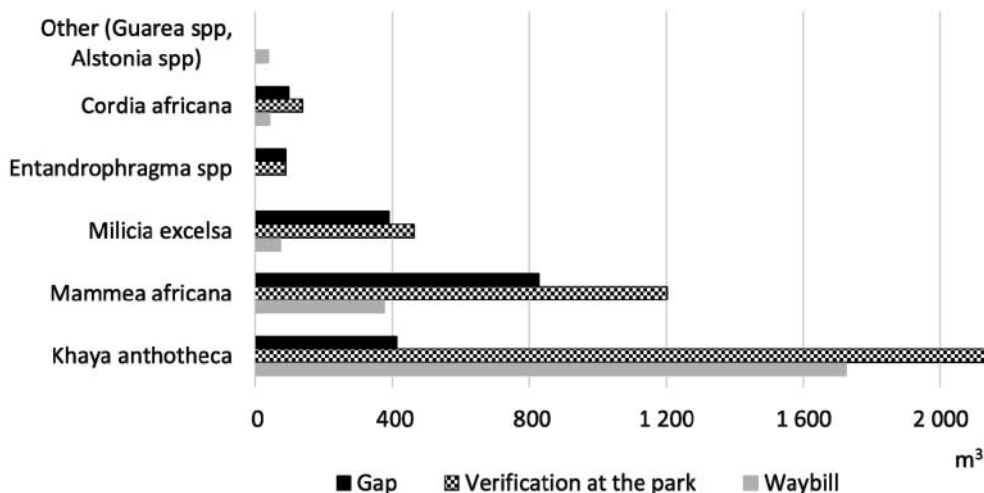
It is noteworthy that regular feedback on provisional results and discussion between loggers and timber park staff during fieldwork led to loggers providing an increased number of tax declarations. Longer-term analyses should confirm (or not) the observed trend; this could help assess the timber park’s usefulness as an instrument that forces exporters to provide proof of payment, thus increasing tax recovery for the government.

For the purpose of this assessment, when proof of payment was missing, the due fiscal amounts were estimated based on data in the transport waybill; this contributed to a discrepancy between declarations and actual amounts due of about USD 34 112 (or about USD 40 483 if *Mammea africana* is in fact *Afzelia bipindensis*), with the largest gaps occurring in the stumpage fees (FIGURE 3).

TABLE 3 Taxes and existence of proof of payment (n=250)

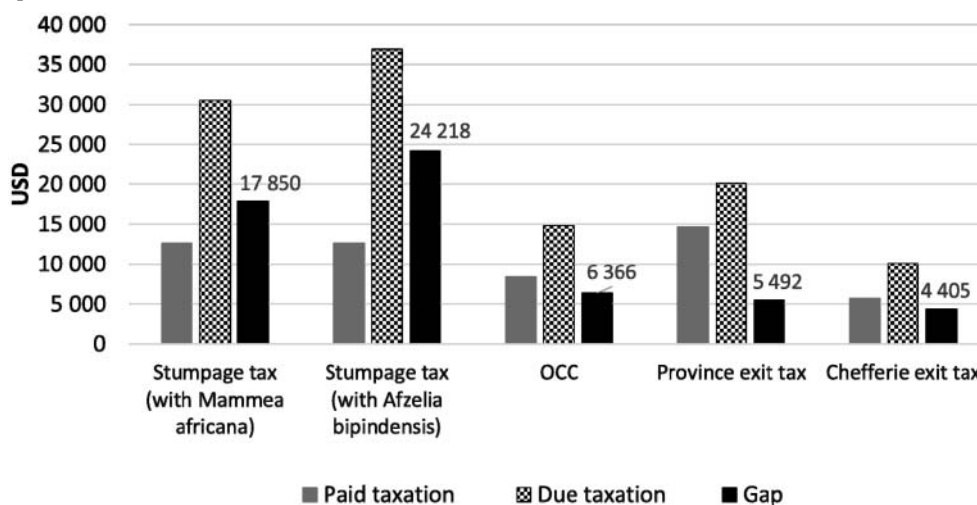
Taxes/services	Proof of payment is available (%)
Stumpage tax	81%
CCO’s service	21%
Province exit tax	49%
Chefferie exit tax	46%

FIGURE 2 Under-declarations, by species (n=250 unloading operations)



¹ One ‘ring four’ plank measures 0.3 m x 0.12 m x 2.8 m, or 0.1008 m³, so 14 planks are equal to 1.4 m³. For the purpose of this study, a correction factor down to 1.3 m³ was made to calculate real volume; this is because some timber loss can occur due to sawing irregularities, as timber is sawn with chainsaws not industrial machines.

FIGURE 3 Discrepancies between declared and due taxes



Timber loaded at the park

As expected from data on unloaded timber, *Khaya anthotheca* (*acajou d'Afrique*) is the most abundantly loaded and exported species. Yet, percentages vary according to the data recorded at the timber park, and those eventually declared at customs (TABLE 4).

In the customs declarations, *Khaya anthotheca* appears under two categories, namely sawnwood and panels (*panneaux*). While overall totals (sawnwood and panels) almost correspond between data recorded at the timber park and that declared to customs (54% and 53% respectively), panels – a finished product according to international standards – are only produced by industrial companies. Again, the likely explanation is that taxes on processed timber are lower than those for unprocessed timber (logs or sawnwood) (République Démocratique du Congo 2012); as such, declarations are made for panels even if no panels actually pass through the park.

Mammee africana is the second species represented in terms of volume, and overall volumes are also similar between data recorded by the park and on customs declarations, 31% and 30% respectively. Yet, as explained above, this is very likely to be another species altogether (possibly *Afzelia bipindensis*),

which has a taxable value three times higher than that of *Mammee africana*.

Over the entire period, the park staff counted a total of 91 trucks declared by three exporting companies (of which one only started operations in May 2021), and estimated the volume at about 4 091 m³, which is very similar to the amounts calculated during the unloading phase (4 031 m³). The discrepancy was assessed to be timber stocks present in the park at the beginning of data collection. Some exporters list two or three trucks on the same customs declaration; this resulted in a total of 73 customs declarations for 91 trucks loaded in the park.

Of the 91 trucks for which declarations were available, only 36% had unique corresponding custom declarations. In theory, each time a truck is loaded, it should have a unique corresponding customs declaration. In practice this is not always the case – as was discovered during fieldwork. For example, when the truck leaves the park, the exporter may not provide a copy of the customs declaration to the timber park. In this case, it should still be possible for park staff to match the customs declaration with the previously loaded truck by using the date the truck was loaded, the truck's plate number, and name of the exporter. Yet this is also not always possible,

TABLE 4 Loaded (timber park) and exported (customs) timber species

Timber species	Quantity as % (according to timber park verification)	Quantity as % (according to customs declarations)
<i>Khaya anthotheca</i>	54	13
<i>Khaya anthotheca</i> – panneaux	0	40
<i>Cordia africana</i>	4	14
<i>Milicia excelsa</i>	10	0
<i>Mammee africana</i>	31	30
(<i>Entandrophragma spp</i>)	1	3
<i>Pericopsis elata</i>	0.1	0
<i>Erythrophleum suaveolens</i>	0.03	0

because – in order to speed up the export procedure – the exporter is allowed to make a customs declaration before loading their truck at the park. This can result in a data mismatch between data recorded at the timber park and data recorded on the customs declaration; for example, the exporter could declare the plate number of a truck that becomes unavailable when the timber is actually loaded at the park, meaning there is a mismatch between plate numbers making it impossible to compare the two declarations.

The total volume declared via customs was about 1 555 m³; this means about 61% of timber loaded at the park for export was undeclared to customs. This gap increases to about 71% if the more plausible ratio for ‘ring four’ planks is used (i.e. 14 planks to 1.3 m³). A monthly illustration of this gap reveals that discrepancies vary between 75% and 50%, with the exceptions of August and December, for which the gaps reduce to about 28% and 12% (FIGURE 4). When closely assessed, such exceptions inspire interesting reflections on environmental governance at the border, which we will take on in the discussion section.

Taxes declared to customs amount to about 27% of due taxes, or 18% if *M. africana* is in fact *A. bipindensis*, which corresponds to USD 119 760 unpaid. These values do not include the CCO’s service; this is because it was not possible to know on which basis this service was actually paid, or where operators should pay it at the border.

Timber in transit at the park

All timber in transit was declared in the customs system as 100% *Khaya anthotheca* sawnwood. In total, 57 trucks were recorded to transit the park, with 53 of them carrying a customs declaration made in the province of origin. However, customs recorded 84 trucks in transit over the same period, which indicates that not all timber heading for the border passes through the timber park, possibly because other border crossings are preferred, or because operators prefer to avoid park controls and instead head straight to the border, typically

during the night or when the park is closed (from 5 pm until 8 am, and Saturday and Sunday).

Of all trucks in transit, 32% are trailers or long trailers (which can carry 1 200 planks), and 68% are medium trailers (800 planks), with declared standard average volumes at customs of 75 m³ and 35 m³ respectively. Interestingly, medium trailers coming from two different provinces regularly declare different volumes, 35 m³ and 20 m³ respectively. No reason could be found for this anomaly, except the use of different local conventions instead of actual verifications of truck loads.

Trucks which passed through the park had Customs declarations corresponding to a total volume of about 3 213 m³, while estimates by the park staff are about 5 234 m³ (or 6 804 m³ if the more realistic ratio of 14:1.3 is used), i.e. declarations are 39% or 53% short of the actual volumes crossing the border. When it comes to unpaid taxes, similar discrepancies to those found in the other assessments were estimated, with a total gap of USD 91 774 (or 149 292 with ratio 14:1.3) between declared and paid taxes (TABLE 5). It must be noted that these values very likely largely underestimate the actual values due, because in our estimates we could only apply the taxation value of *Khaya anthotheca* as the species in transit, which is very unlikely.

DISCUSSION AND CONCLUSION

The DRC government has recently launched an experiment on its eastern border focussing on the verification and monitoring of timber exported to eastern African countries and eventually the world, for example via the port of Mombasa in Kenya. It did so by establishing a timber park, where trucks heading out of the country should pass, for their load and documentation to be checked. This case study has documented the activities conducted in the only existing timber park for almost two years, with data collection over a continuous period of 12 months in 2021 and regular feedback interactions with the park staff and local authorities.

FIGURE 4 Monthly discrepancies between loading operations and customs declarations

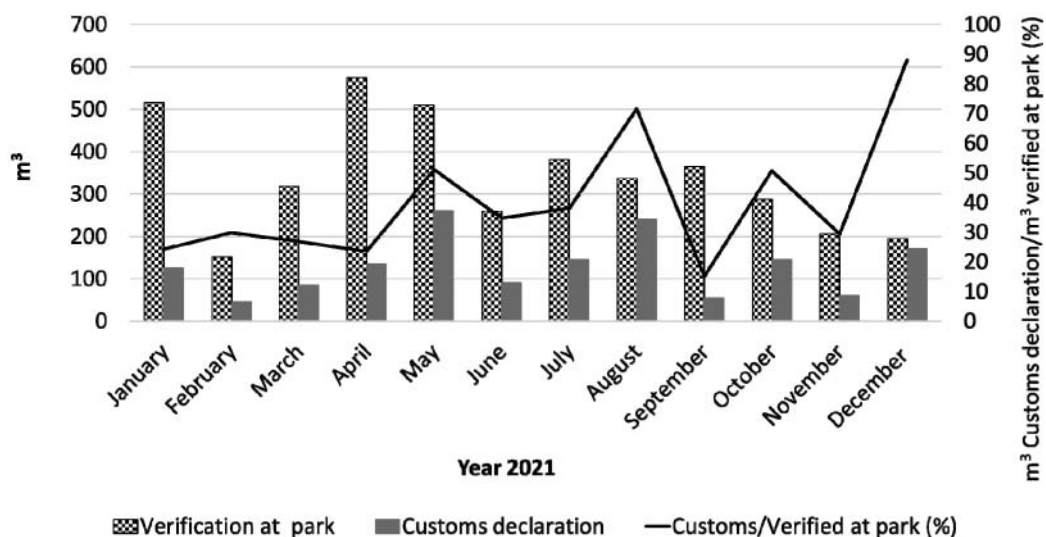


TABLE 5 Summary of discrepancies (volumes in m³ and taxes in USD)

Timber unloaded		Timber loaded				Transit		Total gap at export
Number of timber species								
Timber park	Transport waybill	Gap	Timber park	Customs declaration	Gap	Timber park	Customs declaration	Gap
7	6	1	7	4	3	n.a.	1	n.a.
Timber volume (m³)								
Timber park (14:1)	Transport waybill	Gap (14:1)	Timber park (14:1)	Customs declaration	Gap (14:1)	Timber park (14:1)	Customs declaration	Gap (14:1)
4 031 m ³	2 253 m ³	1 778 m ³	4 091 m ³	1 555 m ³	2 536 m ³	5 234 m ³	3 213 m ³	2 021 m ³
Timber park (14:1.3)	Transport waybill	Gap (14:1.3)	Timber park (14:1.3)	Customs declaration	Gap (14:1.3)	Timber park (14:1.3)	Customs declaration	Gap (14:1.3)
5 241 m ³	2 253 m ³	2 988 m ³	5 318 m ³	1 555 m ³	3 763 m ³	6 804 m ³	3 213 m ³	3 591 m ³
Taxation								
Timber park, due (<i>M. africana</i> and 14:1)	Transport waybill (paid)	Gap	Timber park, due (<i>M. africana</i> and 14:1)	Customs declaration	Gap	Timber park, due (<i>K. anthotheca</i> and 14:1)	Customs declaration	Gap (14:1)
USD 75 405	USD 41 293	USD 34 112	USD 97 485	USD 26 469	USD 71 016	USD 169 634	USD 77 860	USD 91 774
Timber park, due (<i>A. bipindensis</i> and 14:1)	Transport waybill (paid)	Gap with <i>A. bipindensis</i>	Timber park, due (<i>A. bipindensis</i> and 14:1)	Customs declaration	Gap with <i>A. bipindensis</i>	Timber park, due (<i>K. anthotheca</i> and 14:1.3)	Customs declaration	Gap (14:1.3)
USD 81 776	USD 41 293	USD 40 483	USD 146 230	USD 26 469	USD 119 760	USD 227 152	USD 77 860	USD 149 292
Timber park, due (<i>A. bipindensis</i> and 14:1.3)	Transport waybill (paid)	Gap with <i>A. bipindensis</i> 14:1.3	Timber park, due (<i>A. bipindensis</i> and 14:1.3)	Customs declaration	Gap with <i>A. bipindensis</i> 14:1.3			
USD 105 966	USD 41 293	USD 64 672	USD 185 761	USD 26 469	USD 159 292			
							USD 77 860	USD 149 292
							USD 77 860	USD 269 052
							USD 308 584	

Results indicate that with huge distances, poor communication networks, and significant gaps in official knowledge around timber production – even that which is legally compliant and occurs with harvesting titles in customary forests – the paperwork arriving at the borders with the trucks on which timber is loaded is, in many cases, the only documentation by which government officials can check both timber origins and whether due taxes have been paid. As such, officials largely focus their efforts on recording what timber passes through, with a significant focus on financial enquiries, and no more questions asked about the legality or sustainability of the practices which produced that timber.

While such questions may seem irrelevant to various ministries and agencies tasked with increasing revenue collection at the border, they do have direct consequences on various national policies aiming at avoiding further land degradation, supporting forest conservation and management, and overall maintaining the natural capital of the country.

The presence of the timber park and its increased capacity to assess volumes and taxes show that thousands of cubic meters and hundreds of thousands of USD go undetected each year. The park and its staff have shown that in a relatively short period of time, albeit focusing on a relatively small percentage of the total exports, annual revenue losses for the DRC government could amount to USD 308 584 derived from about 7 300 m³ which could remain fully undetected and unpaid for in a situation where no timber park is operational.

Results show that exporters have a marked preference to bypass the timber park altogether and drive straight to the border, where no or less questions may be asked on the truck origin and actual content, notably in terms of timber species. It is thus only possible to guess at the total fiscal losses based on estimated timber exports from the DRC's eastern borders over the years, in the range of 65 000 m³ to 200 000 m³ annually (Cerutti *et al.* 2017, Lescuyer *et al.* 2014, WWF 2012).

The park and its staff allowed for detection of various forms of under- or misdeclaration, in terms of timber species, quantities and taxation. Even in the case of transiting timber, which is not checked at the park, it was possible to detect the very worrying trend that 100% of export declarations mention the same tree species. Because park staff cannot open sealed transiting trucks, it can only be speculated that this finding speaks less to loggers focusing on a single species than to the fact that controls and verification processes in the provinces of origin are very weak if they take place at all. The upstream part of the timber value chain hence deserves increased attention, without which many problems – and indeed revenue losses – will only trickle down to border-crossings where the provincial Governor's team, park or customs staff will have no possibility to solve them.

The presence of the park also immediately and relatively easily sheds light on the thorny issue of what timber species are actually exported, as compared to what is declared on the paperwork, including production, transport, and export. Given that many taxes depend on the species of timber – the more valuable the species, the higher the tax – both producers and exporters have no incentive to declare the highest-paying species, unless random checks occur from time to time as a means of deterrence.

Aside from the single species declared in transit, after a few weeks' training and lab-analyses, the park staff were able to detect the clear mismatch between what was declared as *Mammea africana* and was instead *Azelia spp.*, possibly *A. bipindensis*, one of the most valuable species (in terms of taxation) and also one of the country's most threatened species, with a recent listing in Annex II of the CITES (CITES 2022). During fieldwork, the team observed also many species of the genus *Entandrophragma spp.* (sipo, kosipo, sapelli, tiama), with their characteristic reddish-brownish colour; of which none were ever declared on transport waybills. This remains a speculative assumption and a call for further research, because this case study did not have time or budget to conduct extensive laboratory testing, however species misdeclarations could be a very common trait in need of the government's full attention.

The timber park has also proven very useful in detecting and even changing customary norms adopted by traders and exporters – which are passively accepted by customs and other agencies. Specific conventions, common in various fields, are also possible in the timber sector; internationally, the timber market has grading systems which grant premium prices to the best quality timber. Yet the system currently used in the DRC simply discounts precious timber. Results show that the standard dimension currently used in the DRC – 14 planks – does not, on average, correspond to 1 m³. Instead, a more precise estimate is that 14 planks correspond to about 1.3 m³. This custom acts as a gift to importing countries, who buy 1 unit and get 1.3 units. In fact, results show that, in many cases, countries also buy 1 unit of a less-valuable species and get 1.3 units of the most expensive ones.

Lastly, this case study also shows that a well-coordinated effort by central and provincial governments, with capable human resources and a relatively small budget, is possible and can bring positive returns in the very short-term. Improvements are always possible and today the park should focus on how to generate and manage its own financial resources for its long-term functions to be guaranteed. Yet results indicate that – at least initially – a small percentage of the discovered losses should suffice to operate the park for various years.

While results show that the park in itself can bring positive results, one should not forget that the model should be scaled up to a level whereby exporters are not allowed to choose between exports with and without park. In other words, at least in relatively contiguous geographies where multiple exit options exist, the best impacts can only be had if all exits adopt the park model. If this does not happen, there will always be a tendency for some operators to choose the option without park, at the same time creating unfair competition to the operators passing through the park.

It is also very important that both central and provincial governments maintain their support and show tangible signs of their backing of local teams. Results indicate that such behaviour can immediately pay dividends. For example, when assessing discrepancies between due and paid taxes on a monthly basis across 2021, it is easy to detect two outliers (August and December) during which paid taxes were a very high percentage of due taxes. Both months followed visits

from a high-ranking ministerial delegation in July and November, aimed at verifying export zones and their activities. During fieldwork, it was clear to the research team that those visits brought no new insights or methodologies to park staff for the detection of fraud. Instead, what they brought and left behind was the positive feeling that central and provincial authorities were interested in the results of the park, and openly supported the work undertaken by staff, i.e. their very difficult daily fight against illegal timber trade.

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